Knowledge, Activity and Mediation

A critique of the 'knowledge economy' thesis and its implications for a social theory of pedagogy

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2005

Thesis submitted to the University of London for the degree of Ph.D

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Abstract

This thesis is concerned with the educational response to the concept of the 'knowledge economy'. The thesis argues that:

- this concept, which originated in social and management theory, has been framed in terms of the Cartesian conception of the 'two worlds of knowledge': knowledge of natural and social structures and everyday knowledge;
- these two worlds have been perpetuated in educational policy, for example, in curricula through a strong emphasis on 'knowledge' and 'skills' and in pedagogy through the development of 'pedagogies of reflection'.

Consequently, educational policy has:

- missed that the knowledge economy is making the interdependence between the two worlds of knowledge more explicit in economic and cultural activity;
- failed to appreciate that this development presupposes 'pedagogies' that support to overcome the two worlds of knowledge to respond to the challenges posed by the knowledge economy.

The thesis argues that Cultural-Historical Activity Theory (hereafter CHAT) provides a conceptual framework for going beyond the two worlds of knowledge in social and management theory as well as in educational research, policy and practice. It explores this claim by arguing that Vygotsky's concept of mediation and its extension and elaboration by a number of post-Vygotskians and neo-Hegelians introduces a way of conceiving the relation between activity, thought, language and mind which does not split mind from world. It then uses this reformulation of the conceptual of mediation as a foundation to formulate a pedagogy of mediated activity which it maintains is the basis of overcoming the two worlds of knowledge and responding to the challenge posed by the knowledge economy.

Acknowledgements

First and foremost my heartfelt thanks go to Michael Young without whom the thesis would not have been written. First, in providing me with a 'home' in the Post-16 Centre some years back to develop my ideas about work-based learning. Second, for tolerating the constant re-definitions of the thesis, as I struggled to get to grips with the sociological, social psychological and philosophical themes that have informed its eventual character.

Special thanks also go to Jan Derry who, like Michael, has been a constant source of intellectual stimulation and friendship and who bears the responsibility for opening my eyes to the value of Hegel for my understanding of Vygotsky, and the value of neo-Hegelian scholarship for my thesis in general.

Special thanks also go to Norman Lucas who has helped to keep me sane throughout the last few years, and to Chris Hayes and Nickie Fonda from whom I learnt a tremendous amount about the knowledge economy.

I would like to thank all my colleagues in the COST Action A11 Working Group 2 'Transfer and Boundary Crossing in Vocational Education' led by Yrjö Engström for helping me to deepen my understanding of Cultural Historical Activity Theory, and to David Bakhurst whose contributions to the Lecture Series on 'Rethinking Sociocultural and Activity Theory', that Jan Derry and I have organised at the Institute of Education, further helped me grasp the distinctiveness of the Russian tradition.

My gratitude must also be expressed to my Academic Adviser, Gareth Williams, my Head of School, Karen Evans, and the Director of the Institute, Geoff Whitty, for recommending, supporting and agreeing, respectively, my application for study leave during the Spring Term 2001. This provided an invaluable space at a critical time to think through many of the conceptual issues that surface in the thesis.

A special mention must also go to Lawrence Hazel and Jon Stratton for their friendship and intellectual companionship over the years. They will not necessarily spot or appreciate the influence of our conversations in the thesis but, nevertheless, I know how helpful they have been.

I am also very grateful to Eleanor Rivers who proof read the thesis, Kathy Oliver who compiled the bibliography and Caroline Wickenden who oversaw the final editing. Their respective contributions greatly enhanced its clarity and presentation.

Finally, an extra special thank you to Sarah, Alison and Joanna for tolerating over the last few years my constant obsession with the books and papers that littered the house.

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Chapter 1

The knowledge economy and the challenge for education

Introduction

The idea that we now live and work in a knowledge economy/society has gained increasing prominence over the last decade amongst social scientist and policymakers. The conventional wisdom is that knowledge, irrespective of how it is defined, now constitutes the most important factor of production in the economies of advanced industrial societies; and, as a corollary, the populations of those countries all require greater access to knowledge as represented by qualifications.

It is the contention of this thesis that the conventional wisdom found in the social science literature about the knowledge economy and in the educational studies literature that discusses policymakers' responses to the knowledge economy overlooks the Cartesian legacy of the 'two worlds of knowledge' in their own arguments. By this I mean, both literatures have assumed that theoretical knowledge and everyday/tacit knowledge are separate and different from one another. As a result, conflicting accounts are offered by social scientists as to whether theoretical or everyday/tacit knowledge is the most important economic resource in the knowledge economy, and educational policy perpetuates the 'two worlds' of knowledge in conflicting ways in curriculum and pedagogy.

The central claim of the thesis is that the knowledge economy is making the interdependence that has always existed between these two types of knowledge

more explicit. Thus, the thesis argues that the challenge for educational policy is not to perpetuate the two worlds of knowledge, rather, it is to support us in understanding the interdependence between them so that we can respond more effectively to the challenges the knowledge economy poses.

The thesis explores its claims about the knowledge economy in the following ways. First, it problematises the tendency amongst social scientists and policymakers to treat knowledge as a given, rather than as the outcome of human activity in the world. Second, it asks new questions about how we learn and use the knowledge we develop through formal study and practical activity to transform ourselves and the world in which we live. On the basis of this line of analysis, the thesis identifies a new pedagogy, the 'pedagogy of mediated activity', which it argues helps us to go beyond the two worlds of knowledge.

The thesis has employed, what, following Pinkard (1994:10), can be referred to as a 'Hegelian' stance to formulate the problem it addresses. It reveals that the authoritative reasons which are presented to substantiate the conventional wisdom about the knowledge economy are deficient in their own terms and, moreover, these deficiencies point to the type of account of the knowledge economy and the educational response to that economy advanced here. The remainder of the chapter offers a brief outline as to how it accomplishes this goal.

The *sine qua non* of knowledge economies and knowledge societies

There has been a widespread consensus amongst social theorists (Beck 1992; Bell 1973; Castells 2000; Stehr 1994) that global economic and technological epoch changes have been occurring in advanced industrial economies since the mid-1950s. The hallmark of these 'epochal' theories about social change is that they have tried to 'encapsulate the Zeitgeist in some kind of overarching societal designation; that we live in a postmodern society, a modern society, an

information society, a rationalised society, a risk society and so on' (Osborne 1998: 17).

One particular strand of epochalism, which has been the subject of considerable attention throughout the world, is the 'knowledge economy' thesis. Its origin lies in the social theory debates of the early 1970s about changes in the organisation of production in capitalist economies and the suggestion that: 'We have now entered something of the order of a post-industrial world; a world that appears to be more or less determined by knowledge' (Osborne (1998: 21).

The concept of the knowledge economy was first used by Drucker (1969:263) to refer to the application of knowledge from any field or source, new or old, to spur economic development. However, the figure who is best known for drawing attention to the impact of knowledge on the economy and society is Daniel Bell. More recent contributors to the debate, for example, Castells (19(6, and Stehr (1994) have not changed this argument, rather they have elaborated and extended Bell's original thesis as well as adding further contexts in which the impact of knowledge is identified[1]. In another arena, management theorists such as Drucker (1993) and Nonaka and Takeuchi (1995) have linked knowledge to changes in competitive strategy, management practices of firms and, above all, to the continuous improvement or transformation of products and services.

Taken in combination, all these writers maintain that the *sine qua non* of advanced industrial economies and societies is that they are now organised around the relationship between the production and communication of knowledge.

1 I have chosen not to discuss social theorists such as Beck (1992) who has focussed on ecological risks resulting from the alliance between science and capital and Giddens (1991) who has drawn attention to the micro-scale of this new role of knowledge within the economy and society. These are important manifestations of the new role of knowledge within the economy but are not central to my concern for the link between the knowledge economy and educational policy.

The *sine qua non* of policymakers' response to the knowledge economy

The idea that knowledge is central to economic development has captured the minds of many educational researches and policymakers. This is evident from the way in which the term 'the knowledge economy' surfaces with increasing regularity in educational studies (Griffiths and Guile 2004; Hargreaves 2003; Muller 2001; Moore and Young 2002) and also in UK (DfEE 1998) and EU (1995) educational policy. Certainly, educational policy has been increasingly premised on the basis of the link between education and national competitiveness since the early 1990s, most often expressed in terms of the importance of investing in human capital (Brown and Lauder 1991). The election of 'New Labour' in 1997, however, led to the concept of a knowledge economy being deployed in the policy literature in two senses. It provided a vision of future economic activity but also intertwined this with a policy for lifelong learning. This new emphasise can be seen quite clearly in the words of David Blunkett, the then, Secretary of State for Education. He wrote in the Foreword to the Green Paper 'The Learning Society':

'We are talking about investing in human capital in the age of knowledge. To compete in the global economy, to live in a civilised society and to develop the talents of each and every one of us, we will have to unlock the potential of every young person'.

DfEE (1997: 3)

Furthermore, the Secretary of State observed:

'Learning is the key to prosperity - for each and everyone of us as individuals, as well as for the nation as a whole. Investment in human capital will be the foundation of success in the knowledge-based global economy of the twenty-first century'.

DfEE (1998: 7)

This notion of the link between education and the economy has resulted in New Labour's acceptance that the UK economy is a knowledge economy that requires

an increased number of creative and ingenious workers. As a corollary, what is required is an extension of access to, and choice about, the type of knowledge people want to acquire at different points in their lives.

The government emphasis on promoting learning - a term that is increasingly used in policy instead of education as a strategy to support employability in the knowledge economy undoubtedly reflects a genuine attempt to foster a more informed populace (Young 2000). Nonetheless, despite invoking lifelong learning as the cornerstone of an educational policy that is designed to prepare people for living and working in a knowledge economy, New Labour has only partially grasped the problem that their polices purportedly address. Policymakers have failed to understand the implications of the epochal changes that have been occurring in modern economies and, in doing so, have misunderstood their educational implications.

UK policymakers have defined the *sine qua non* of educational policy as more extensive investment in education in order to shift the economy towards a 'high skill' strategy. This policy prescription presupposes that globalisation has a uniform economic impact, that UK firms will be forced to move into 'knowledge-based' product and service delivery to compete in the knowledge economy, and that there will be an increased demand for higher levels of skill. The problem with this position is that it assumes a neat correspondence between the demand for, and the supply of, skills - thereby overlooking that UK firms are not, in the main, choosing to adopt high skill business strategies (Lauder 2004: 380). It is not possible to stimulate the demand for skills through supply-side measures alone (Keep 1999). It is also necessary to address political economic issues about the 'economic architecture' required to reposition the national economy for developing a more high skilled trajectory (Lloyd and Payne 2003). This is an important issue. However, it is not one that can be adequately dealt with here.

An alternative *sine qua non* of the knowledge economy

There are a number of other issues about the new role of knowledge in the economy that are rarely acknowledged. Moreover, these issues have significant consequences for our understanding of the knowledge economy and, more particularly, for educational policy for a knowledge economy.

The first issue is that at the heart of the discussion in the social sciences about the concept of the knowledge economy, is a difference in views about what constitutes knowledge. Social theorists stress that economies in advanced industrial societies are now organised around the relationship between the production, communication and application of science (Bell 1973; Stehr 1994) or the secondary elaboration of science as technology (Castells 2000). In contrast, management theorists stress the centrality of 'tacit' knowledge (a term that will be defined later) in the economy. They point to the crucial role of tacit knowledge in new modes of knowledge based on criteria that are qualitatively different from traditional science, and that both facilitate innovation in products and services (Gibbons *et al.* 1994) and in managing product and service delivery (Nonaka and Takeuchi 1995).

This thesis argues that the reason why the social and management theorists have identified different types of knowledge is that they have represented the new role of knowledge simply as an effect of which ever of the new conditions they have emphasised. This has happened because they have accepted implicitly a Cartesian or 'two worlds' view of knowledge (Bakhurst 1995)[2]. According to Bakhurst, the first 'world' is the material world and the 'second' is the world of emotions, sensations, beliefs and intentions. Theorists who are concerned with

[2] Bakhurst originally coined this distinction to explain the enduring influence of Descartes in Soviet philosophy. Bakhurst argued that many contributors to Soviet philosophy have struggled to overcome the dualism between 'idealism' and the 'materialism' and hence the separation of the individual from the world. It is the contention of this thesis that Bakhurst's distinction can be used to identify the influence of Descartes' mind/world dualism within the sociological and organisational proponents of the knowledge economy.

the former tend to adopt what will be referred to here as, a 'scientific realist' epistemological stance; thus, they concentrate on the increase in knowledge-based products and services and expert systems as the primary indicators of the knowledge economy. Theorists who are more concerned with the latter are more disposed to adopt what will be referred to here as a 'postmodern' or pluralist conception of knowledge. Thus, they concentrate on the increased contribution of non-scientific forms of knowledge to the improvement of products and services as well as the development of new products and services as the primary indicators of the knowledge economy.

In adopting these epistemological positions, the social and management theorists play down the longstanding relationship that has always existed between them and, therefore, between the two worlds of knowledge. As a consequence, they have failed to detect that what is distinctive about the knowledge economy is that it is making the interdependence between the two worlds more explicit. The reason this is happening is because as knowledge, irrespective of its definition, becomes more central to economic and social life, there is an increasing need to mediate - a term that will be explained later - between different forms of knowledge and types of concepts.

The observation about the mediation of different types of knowledge anticipates the third reason policymakers have misunderstood the significance of knowledge economies/societies. Knorr Cetina (1999: 8) points out that these types of economies and societies presuppose the existence of knowledge cultures and it is these knowledge or 'epistemic' cultures which foster the production and application of knowledge that is responsible for the flow of knowledge-based products and services. Hence, it is epistemic cultures, not just knowledge itself, which are central not only to the economy but also to societies that 'run on' knowledge and expertise. These cultures constitute the settings in which new theoretical knowledge is produced and where existing forms of knowledge are reconfigured and applied in new ways. Without them, there would be no

knowledge-based products and services nor experts whose knowledge can be tapped into.

It is the contention of the thesis that the above observations about the knowledge economy present a qualitatively new challenge which has not yet been recognised by policymakers. Part of the reason why policymakers have misunderstood the challenges posed by the knowledge economy is that they have clung to a very instrumental and reductionist conception of knowledge. Knowledge is not merely a matter of expertise, as represented by a higher proportion of the population who have higher level qualifications (Delanty 2001: 5). Knowledge also implies a capacity for learning and engaging with ideas. Another reason why policymakers have misunderstood the demands of living and working in a knowledge economy is that working and living does not simply involve the application of pre-given forms of knowledge, skill or rules (Lash 1999: 5). It presupposes that we have developed a capacity for self-interpretation and working collaboratively to create new knowledge, skill or rules which are appropriate for the new situations that we encounter.

The challenges imply that a switch in focus in government policy is needed. The increased demand for the 'product' of knowledge in the economy cannot be assumed to imply an increased demand for an existing 'educational product' (i.e. more highly qualified people). In accepting the onset of the 'knowledge era', we cannot continue to treat knowledge as though it were an 'ahistorical force that is as stable and sociologically undefinable as geological formations' (Knorr Cetina 2001) nor treat learning as though it is 'purely expressed by qualifications' (Young 2000). We need to develop a broader concept of the relationship between knowledge and learning and this involves a new attention to pedagogy.

This argument should not be mistaken for a reformulation of Brown and Lauder's (2003) ideas about the development of 'collective intelligence'. That was primarily an attempt to articulate a political-economic definition of intelligence

based on 'relations of trust' between communities, rather than relying on individualistic and mentalistic (i.e. IQ) definitions of intelligence. In contrast, this thesis argues that in order to develop a broader concept of knowledge and learning, it is necessary to address a number of epistemological and pedagogic challenges. These involve establishing a conceptual framework to identify the differences and relationships between different forms of knowledge and identifying the social practices that allow mediation between these different forms of knowledge.

Going beyond the two worlds of knowledge in theory and policy

The thesis argues that Cultural-Historical Activity Theory provides a conceptual framework for beginning to address these challenges. This may be a bold claim since the intellectual origins of the Russian intellectual tradition has been summarily dismissed by many western writers since the collapse of communism (Fukyama 1993).

The claim is substantiated by arguing that Vygotsky's concept of mediation provides a way of conceiving the relationship between the two-worlds of knowledge. One of Vygotsky's great insights was to locate the development of cognition, culture, knowledge and social institutions in a single overarching view of human activity. Thus, he does not split mind from world, divorce the material world from the world of human experience nor deny the relationship between, what he refers to as 'theoretical' and 'everyday' concepts. Vygotsky argues that we know the world through activity and different types of activity allow us to know it in different ways. Hence the challenge is to learn to mediate between these different forms of knowledge and knowing, rather than to assume that because they are different they have to be treated separately from one another.

This argument is explored in a number of interconnected ways. It draws on the work of a number of post-Vygotskians who have extended and elaborated the concept of mediation by identifying contexts other than formal education as sites

for mediation and resources other than books to facilitate mediation. It has also drawn on a number of philosophers, for example, Ilyenkov, McDowell and Brandom, who have articulated epistemological positions which it is gradually been recognised can be used to clarify and extend the main tenets of Vygotsky's ideas about cultural development. The thesis uses the work of Ilyenkov and McDowell to make explicit the social basis of reason which is, as Derry (2003) is the first to note, implicit in Vygotsky's concept of mediation because of the influence of Hegel on his thinking. It then uses another philosopher, Brandom, to establish the pedagogic implications of this social conception of reason.

On the basis of the interconnections between mediation, reason and activity, the thesis concludes by formulating a social theory of pedagogy, which it refers to as a 'pedagogy of mediated activity'. The cornerstone of this pedagogy is the idea that to respond constructively to the challenges posed by the knowledge economy it is necessary to overcome the two worlds of knowledge dichotomy and this is only possible by appreciating the relationship as well as the difference between them.

The methodological approach

This thesis is an exposition of extended theoretical research that has attempted to identify the problematic nature of knowledge in the social science debate about the knowledge economy and in the policymakers' response to the idea of it. The remainder of this section explains the basis upon which the thesis has used theoretical research to pursue its own argument.

For many people, theories are, as Engeström (1987: Ch 1. 5) argues, either constructed through inductive generalisations from so called empirical facts or are purely speculative reasoning. This is not the view of theory adopted here. Following Vygotsky, theory is here conceived of as a way of putting us in touch with the world because it is a product of our activity in the world because it supplies clues and insights as to how to answer questions about the knowledge

economy, yet always in a way that leads to a constructive reformulation of the problem rather than to solution (Derry 2003). That is, the thesis uses propositions and findings from previous analyses to identify the most advanced state of theorising within a number of currently dominant paradigms. The notion of most advanced theorising refers to:

> 'theorising that either crystallises the dominant conception in a very clear fashion or in its aspiration to go further, tendentially exceeds the conceptual and methodological boundaries of that paradigm and thus make those boundaries or limits visible. However, such theorising is also acknowledged as advanced within the paradigm - it is not generally regarded as mere eccentric curiosity'.
>
> Engeström (1987: Ch1.7)

Given the focus of this thesis, this has involved identifying the most advanced theorising in three different paradigms: the social theory and management paradigm for perspectives on the knowledge economy, the Activity Theory paradigm for its ideas on mediation and, finally, the neo-Hegelian paradigm for the social basis of reason. It maintains that the selection of key authors allows the thesis to progressively sharpen the questions that need to be asked.

It was fairly straightforward to select representatives of the social theory paradigm since Bell, Castells and Stehr are widely cited as having developed the central argument about the knowledge economy/society. It was less straightforward to select the representatives of the management paradigm because it is a notoriously eclectic field. The criterion used to inform the selection the representatives of that paradigm - Gibbons and colleagues, Nonaka and Takeuchi and Zuboff - was that they have each articulated very different expressions of the role of tacit knowledge in the knowledge economy. On the basis of this criterion, I have chosen not to discuss Drucker, even though he was one of the first management theorists to acknowledge the contribution tacit knowledge made to economic development. Drucker merely affirmed this role for tacit knowledge; he did not identify the type of tacit knowledge nor any

distinctive role for that knowledge. It was also fairly straightforward to select the representatives of the activity theory paradigm since Davydov, Engeström, Leont'ev, Lave and Wenger, Vygotsky and Wertsch are the most widely cited as having developed Vygotsky's ideas about mediation in significant ways.

Finally, I have taken up theoretical insights from outside the social theory and activity theory paradigms in order to highlight a number of problems with those paradigms. In the case of the social theory, I have drawn on Knorr Cetina who has turned the social science debate about knowledge economies and knowledge societies on its head by arguing that knowledge economies or societies presuppose the existence of knowledge cultures. The idea of knowledge cultures, with its emphasis on the cultural tools we use to create knowledge, serves as a link to Vygotsky's ideas about mediation. While the writings of Bakhurst and Derry - whose intellectual interests span Activity Theory and neo-Hegelianism philosophy led me to see the relevance of the work of Brandom, Ilyenkov and McDowell to the argument of the thesis.

The structure of the thesis

Chapter 2 locates the origins of the concept of the knowledge economy in the work of Daniel Bell and his argument that theoretical knowledge (i.e. science) constitutes the axial principle' of innovation and economic growth in advanced industrial societies. It illustrates how the concept of the knowledge economy has gained credence as Bell's original ideas have been built on and extended by other sociologists, most notably by Castells and to a lesser extent Stehr.

Chapter 3 examines a contrasting view of the new role of knowledge in the economy; namely that it is the tacit knowledge held by workplace communities of practice that are central to economic development. It discusses three different expressions of this suggestion about the centrality of tacit knowledge to the production of new knowledge and, what is referred to as, 'knowledge work' - Gibbons and colleagues (1994), Nonaka and Takeuchi (1995) and Zuboff (1988).

Chapter 4 explains the origins of these two different accounts of the knowledge economy. It argues that the reason for the difference of view in the social and management theorists about which type of knowledge is important in the knowledge economy originates in the Cartesian notion of the 'two-worlds of knowledge': knowledge of natural and social structures and knowledge of emotions and identity. It identifies a number of legacies of Cartesian thinking about the separation of the two worlds. First, it makes it difficult for many social scientists to appreciate the way in which the knowledge economy is making the interdependence between the two worlds more explicit. Second, it also makes it difficult for them to appreciate the link between knowledge economies or societies and knowledge cultures. Third, it leads social scientists and policymakers to overlook the mediated basis of the relationship between the two worlds.

Chapter 5 discusses the legacy of the two worlds of knowledge idea in that part of the educational studies literature concerned with higher education. It argues this legacy has been perpetuated in practice in the higher education curriculum in two main ways: a strong emphasis on the acquisition of existing conceptions of knowledge together with a series of initiatives to accredit experiential or tacit knowledge within degree programmes. In recognition of the existence of these two types of knowledge, there has been a determined effort in higher education to revise the traditional approach to pedagogy by devising what is referred to here as, 'pedagogies of reflection'.

Chapter 6 begins by acknowledging that there have been several attempts by philosophers to address the two worlds of knowledge most notably the work of John Dewey. One of Dewey's (1989) primary concerns was to articulate a pedagogy based on his concept of 'reflection' that allowed exploration of the relationship between ideas and practical activity. The chapter argues that Dewey continued to operate with an epistemology that separates mind and world even through he stresses the transactional nature of their interrelations. It follows that

he does not provide a pedagogic framework that allows him to overcome the two worlds of knowledge, as he does not address the interdependency of the two worlds. The chapter maintains that Cultural Historical Activity Theory, on the other hand, does provide a conceptual framework that deals with the relationship between mind, world and activity. The chapter outlines the main tenets of Vygotsky's theory of cultural mediation and argues that Vygotsky provides both a way of understanding the two worlds of knowledge relationship and also their differences.

Chapter 7 extends and elaborates this analysis by focusing on a number of writers - Davydov, Engeström, Lave and Wenger, Leont'ev and Wertsch who are widely acknowledged in Cultural Historical Activity Theory for having made significant contributions in developing the concept of mediation. The chapter identifies the concerns that led them to develop the concept and clarifies the way in which they have broadened (i) the context of mediation; (ii) the cultural tools that facilitate mediation; (iii) the outcomes of mediation. It points out that, in doing so, they reject Vygotsky's distinction between theoretical and everyday concepts and thus problematise the extent to which the concept of mediation constitutes the basis for going beyond the two-worlds of knowledge.

Chapter 8 uses the work of Evald Ilyenkov and John McDowell to address the tension points generated by the post Vygotskians' elaboration and extension of the concept of mediation. Despite their historical and intellectual separation, the chapter claims Ilyenkov and McDowell's work establishes a philosophical basis for an epistemology to underpin Vygotsky's concept of mediation that overcomes the two worlds of knowledge. The principle feature of this epistemology is that the mind is not separated from the world because our activity is in the world. From this standpoint, it can be argued that the world offers us reasons for why things are thus and so.

Chapter 9 identifies the pedagogic implications of the epistemological discussion in the preceding chapter. It introduces Robert Brandom's ideas about the social practice of giving and asking for reasons to elucidate the links between mind, world and activity. It argues that this social practice constitutes a form of knowledgeability based on establishing inference. That is, the capability of understanding what follows on from adopting a specific position, why it follows and its implications for future thought and/or action.

Chapter 10 maintains that the preceding epistemological and pedagogic argument provides the basis for a social theory of pedagogy, which the chapter refers to as the 'pedagogy of mediated activity'. First and foremost this conception of pedagogy rests on the assumption that we have a mediated relationship with the world. The second assumption is an acceptance of the social basis of reason and that learning presupposes the social practice of the 'giving and asking for reasons'. The chapter argues that a pedagogy based on these assumptions is able to go beyond those 'pedagogies of reflection' and 'participation' (which were discussed in Chapter 6) that have been so influential in higher education models of relating theory to practice.

Chapter 11 reflects critically upon the arguments laid out in this thesis and outlines some pedagogic issues which warrant further exploration.

Chapter 2

The role of scientific knowledge in the economies of advanced industrial societies

Introduction

The aim of the next two chapters is to look at differing views on which type of knowledge is central to economic development. This chapter examines the debate about the centrality of scientific knowledge in modern economies from a sociological perspective. The next chapter will address the management theorists' argument about the centrality of tacit knowledge.

The argument that knowledge in the form of science has become the major factor in economic development first surfaced in social theory and sociology in the late 1960s and early 1970s (Bell 1974; Touraine 1969)[1]. This chapter argues, for a number of reasons, that Daniel Bell's book the *Post-Industrial Society: a Venture in Social Forecasting* (Bell 1973), provides the natural starting point for any analysis or debate around this issue.

Having discussed the main premise of Bell's argument that knowledge was now the 'axial principle of economic development', this chapter then moves to Manuel Castells' treatise on the emergence of the *Information Age* (Castells 1996) and Nico Stehr's analysis of the evolution of *Knowledge Societies* (Stehr 1994). The assertion is that both take Bell's argument about the role of scientific knowledge a step further. Castells, although influenced by a more sustained engagement with Marxism than Bell[2], drew on and deepened Bell's analysis

[1] The contribution of knowledge as a factor in production has also had a fairly 'hidden' history in Economics. For a recent assessment see the special Issue of *The International Social Science Journal* No 171, Fe-Mar (2002).

[2] Having originally adopted a Marxist mode of analysis, Bell rejected this theoretical tradition. He conceived of his work from the early 1960s as an attempt to go beyond what he felt were the theoretical weakness of Marxist preoccupations with general theories of social causation (Bell 1974: 10). Castells, however, has continually endeavoured to re-think the relationship between his developing scholarship and particular Marxists concepts, such as the mode of production. The

and explanation of the connection between technological change and the role of knowledge and information in advanced industrial societies (Webster 1997: 79-80). The chapter concludes by pointing out that, whereas Bell and Castells viewed knowledge primarily as though it was a technical asset, Stehr (1994: 91) defined knowledge as a 'capacity for action' and, in so doing, linked this definition to the idea of knowledge work.

However, the chapter does not attempt to present an exhaustive analysis or general critique of the theoretical and empirical studies of these writers. Nor does it respond to other sociologists who have done so, for example, Giddens (1973) and Robins and Webster (1999) on Bell, Calhoun (2000) and Touraine (2000) on Castells, and Delanty (2002) on Stehr (2001). The chapter is more circumscribed, concentrating primarily on those arguments that address the role of knowledge either within the economy or more generally throughout advanced industrial societies.

Knowledge and industrial change

Introduction

In industrial sociology theories, the contribution of scientific knowledge to societal development has always had a somewhat contested and hidden history. It has either been viewed as an enabling factor or as a potentially subversive factor in the process of industrialisation (Kumar 1995; Touraine 1969). The more utopian perspectives on industrial society (which are associated with Comtian-influenced sociologists) viewed science as though it constituted some form of 'enlightenment' (Osborne 1998: 43). They stressed that the application of the logic of science supports the creation of a rationally organised and planned society and, moreover, that this development leads to the replacement of all irrational and particularistic forms of power. In contrast, the more skeptical and critical perspectives (which are associated with Marxist-

Information Society attempts to spell out the advantages as well as the inequities and injustices of a 'networked' world.

influenced sociologists) viewed science either as a form of exploitation. Some Marxists linked science to the economic, political and military power bases in society and argued that this linking provided the ruling elite with a means to legitimate their specific interests. Alternatively, other writers conceived of Marxism as a form of science that provides a framework for predicting the trajectory of change within societies.

Despite the existence of these two radically different interpretations of the contribution that science could make to the development of industrial societies, both the 'utopian' and 'sceptical' theories were inclined to share certain assumptions about the character of industrial societies. They both emphasised that land, labour and capital were the most important factors of production, and that the process of industrialisation was dependant on their successful exploitation (Kumar 1995). Consequently, until the 1970s, sociologists concentrated primarily on the industrial relationships that helped to shape the process of production rather than on the 'technological application of science' that was underpinning the rapid development of new industries.

The shift from an industrial to a post-industrial society

Bell (1973:9) used the term 'post-industrial society' to explain the trends he believed were responsible for fundamentally changing 'the social framework of Western society' in the late 1960s and early 1970s. In his introduction to *The Coming of the Post-Industrial Society* (Bell 1974: 3), he describes the book as an 'essay in social forecasting', because in it he tries to make sense of the extensive empirical evidence he had amassed about a number of changes in industrial society. In particular he emphasised the gradual break-up of what he referred to as 'family capitalism' in industrial society and the changing composition of the labour force, as evidenced by growth in the 'tertiary; (i.e. leisure, travel and tourism, entertainment), 'quaternary' (i.e. education, medicine, social services, environmental health) and 'quinary' (i.e. regulatory bodies) sectors.

Bell (1974: 13) was particularly concerned with how 'changes in the social structure posed questions for the rest of (industrial) society' because these changes were resulting in a highly specialised division of labour, the emergence of a new 'technical' mode of management and the escalating influence of science and technology on everyday life in industrial societies. Unlike Marx and many other sociologists such as Tocqueville and Weber, who according to Bell, had sought to provide a 'general theory of social causation' (1974: 10), that was applicable to all industrial societies, Bell (1973(a):10) tried to develop an analytical framework that 'specified not causation but centrality'. By this he meant, a method of analysis that allowed him to identify the 'organising frame' that enables societies to change (Bell 1974: 10).

To clarify his ideas about the transformation that was occurring, Bell contrasted the different types of economic problem faced by an industrial society with the problems faced by what he called the emerging post-industrial society. The chief economic problem that had confronted those societies that were beginning to industrialise was that they had to 'engage in a game against nature' (Bell 1994: 116). By this he meant that the process of industrialisation involved societies using steam power to transform the 'natural environment' into a 'technical environment'. This pattern of development implied that the most important sectors in industrialising societies were primary sectors, such as mining and farming, which directly supported the transformation of the environment, rather than secondary sectors, such as engineering and technical or semi-skilled factory work, that were directly involved with product design and product manufacture. Consequently, for Bell, the chief economic problem faced by industrial societies was the generation of sufficient financial capital to produce and manufacture goods and services (Waters 1996), since economic development in industrial societies relied on 'machine technology', that is, the application of manufacturing technology within the process of production.

In contrast, Bell argued that post-industrial societies confronted an entirely different set of circumstances. The primary reason for this change was that economic development increasingly rested on 'intellectual technology' (Bell

1973a: 116). Intellectual technology had, according to Bell, two distinctive features: the use of scientific knowledge to specify ways of doing things in a reproducible manner and the substitution of problem-solving rules (i.e. algorithms) for intuitive judgements. As Bell argued (1973a:30) 'what is distinctive about the new intellectual technology is its effort to define rational action and to identify a means for achieving it'. Thus, for Bell, social planning was a logical, practical and instrumental process that was determined by the accuracy and precision of the application of knowledge.

Scientific knowledge as the 'axial principle' of society

Although he accepted that some form of knowledge had always been central to the functioning of any society (in the sense that knowledge is an anthropological universal) Bell argued that what was distinctive about postindustrial societies was the change that had occurred in the character of knowledge itself and in the role that it played. He identified this as the 'axial principle' of the post-industrial society, namely the 'centrality of theoretical knowledge as the source of innovation and policy formation for that society' (Bell 1974: 164).

This 'axial principle' of the social structure of post-industrial societies refers to the application of codified knowledge, that is, theoretical or scientific knowledge (Bell employs the terms interchangeably). The major change, he claims, is that societies are now dependent on theoretical knowledge as a source and mode of innovation. This is particularly apparent in the 'new science based industries.... computers, telecommunications, optics, polymers and electronics' (Bell 1974: 23). Such industries are, in contrast to earlier industries, dependent on the codification of knowledge into abstract systems of symbols that support further innovation and hence the development of new goods and services.

Bell used the exponential growth that had occurred in research and development (R&D) as evidence of this 'axial principle'. He acknowledged that although the conventional wisdom of the late 1960s and early 1970s accepted

that expenditure on R and D constituted a 'financial' measure of the growth of science and technology within society (Bell 1974: 250), there were 'analytical problems' if expenditure on R and D is related to economic growth, scientific productivity and innovation. Nevertheless, Bell (1974: 250) argued that it was still possible to employ 'a simple indicator' relating knowledge and economic growth. He defined this simple indicator as:

'the commitment of a country to its scientific and technological potential by the expenditure on R and D and, to secondary extent, on education'.

To illustrate this argument, Bell highlighted how expenditure on R&D in the USA had multiplied by fifteen times since the end of the Second World War and argued that this increase had become a symbol to which other countries aspired. The most striking feature of this unparalleled growth in R&D was that it was state-led rather than led by the private sector, although the work being undertaken by industry, by universities and by non-profit organisations, the federal government had supplied most of the funding. This led Bell to conclude that, despite the analytical problems associated with the measurement of knowledge and technology, the revolutionary nature of the new 'intellectual technology' was the driving force behind the shift from industrial to post-industrial societies. This momentum would be sustained, according to Bell, because the sources of innovation were increasingly derived from the research and development agencies. Furthermore, the 'weight' of society' - as measured by the proportion of the Gross National Product and the share of employment - was increasingly falling in fields that were related to the production or application of the outcomes from research and development[3].

[3] One of the main influences on Bell's thinking was the collection of theoretical and empirical studies produced by the highly celebrated American economist Robert Solow (1957) on the contribution of technology to productivity. Solow described the fundamental sources of long-run growth in terms of the link between capital accumulation, labour force growth and technical progress. From Solow's perspective, increases in productivity are a result of the increased technological application of science in the economy that leads to shifts in the ratio between labour and capital. Thus, unlike earlier generations of economists, Solow acknowledged that factors such as technology, which are exogenous to the basic components of economic theory (i.e. investment in capital and the growth rate of the labour force), are equally important as those factors in raising levels of productivity.

Because he was primarily concerned with, what he referred to as, the 'social utility' of knowledge, Bell defined knowledge as:

'a set or organised statements of facts or ideas, presenting a reasoned judgement or an experimental result, which is transmitted to others through some communication medium in some systematic form'.

Bell (1974: 175)

Bell referred to this as a 'restricted definition' (Bell 1974: 176) limiting 'knowledge' to a form of 'intellectual property' that is either certified by copyright or through some form of social recognition (for example, a publication). For Bell (1974: 344), modern societies only survived through a process of constant innovation and by attempting to anticipate the future in order to plan ahead because:

'Every society now lives by innovation and growth, and it is theoretical knowledge that has become the matrix of innovation'.

Put simply, theoretical knowledge serves a dual purpose in society. On the one hand it is central to the process of innovation, on the other hand it is central to planning and forecasting. Thus, for Bell, theoretical knowledge legitimates a technocratic concept of social planning (Bell 1974: 349).

One consequence of the new role of knowledge in society is the change in relative importance of different industrial sectors. Bell attributed this to the increased dependency on the generation of information in post-industrial economies. He defined this as 'data processing in the broadest sense; the storage, retrieval, and processing of data' (Bell 1979: 168).

Bell identified two shifts in the division of labour as a result of this trend (Waters 1996: 113). The first shift was a move towards a service economy, that is, a growth in the number of white-collar employers in the 'co-ordination sectors' of the economy (for example banking and finance) and a corresponding growth in the number of people employed in personal and

leisure services. The second shift was the emergence of new, specialised enterprises such as computing companies and the corresponding development of new, specialised occupations, for example, software engineers.

Taken in combination, Bell argued that the shift towards a service sector economy and the increased application of knowledge as a *source* of economic value constituted a profound transformation in industrial societies. He claims that instead of the character and wealth of society being determined in terms of a labour theory of value, as traditionally accepted by social scientists, post-industrial societies are being determined by a 'knowledge theory of value':

> 'when knowledge becomes *involved* in some systematic form in the *applied transformation of resources* (through invention and design), then one can say that knowledge, not labour, is the source of value'.
>
> Bell (1979: 167-68)

Thus, it is the application of knowledge at every stage of the production process (i.e. conception, realisation and distribution) that is responsible for determining the value of a particular good or service.

Since the early 1970s, the idea that knowledge constitutes the axial principle of economic development has continued as a central issue in sociological debates about changes in the structure of advanced industrial societies (Castells 1996; Kumar 1995; Webster 1995). This is partly because one of the enduring strengths of the 'post-industrial society' concept is that it has provided a comprehensive theoretical model for analysing economic and technological change (Kumar 1995: 1-5). It is also, in part, because Bell's premises have been reinvigorated by Manuel Castells's trilogy *The Information Age: Economy, Society and Culture* which attempts to move beyond Bell's analysis and pin down the implications of the revolution in information and communication technology for advanced industrial societies.

Information and communication technology and the networked society

Introduction

Castells's trilogy has been heralded as the single most important analysis of the state of the world produced by a sociologist in at least a generation (Calhoun 2000; Lyon 2000; Touraine 2000; Webster 1997a). It contains three main lines of argument[4]. The first is a continuation of Bell's argument that knowledge (in Castells terms information generation, processing and transmission) has superseded land, labour and capital as the fundamental sources of productivity and power[5]. Castells, however, goes a step further and maintains that this has resulted in the emergence of a new economic paradigm - an 'informational' economy. He extends his analysis by introducing two further propositions about this new paradigm: it is 'global' and 'networked'. Furthermore, he argues, the emergence of this global and networked informational paradigm is simultaneously hastening an integration of world affairs and also bringing about increased social fragmentation since they have a very uneven impact within and between societies and regions. The account presented in this chapter of Castells's thinking concentrates mainly on the implications of 'informationalism' in relation to economic activity; an argument he presented in the first volume of his trilogy and in the revised second edition (2000).

Castells's debt to Bell

[4] It is important to note that Bell claims that Castells has not advanced significantly his thesis about the role of knowledge within the economy, nor distinguished between the different functions knowledge and information serve in the economy (Bell 1999 :xxiii-xxiv).

[5] In the Second Edition of the *Networked Society*, Castells links his argument about informationalism to the debate in contemporary economics about the emergence of the 'new economy' (2000:7 7-147). His intention, as he makes clear, is to demonstrate the similarity between the two arguments. He argues that his thesis, the *Informational Age,* is based on three assumptions about the economy; that it is global, informational and networked. In contrast, he argues that the proponents of the new economy mainly focus on the accelerating impact of globalisation and the deployment of information and communication technology and tend to play down the 'networked' dimension of the new economic conditions. The exposition of Castells's analysis in this chapter concentrates on his argument around the impact of information and communication technology on economic activity. It does not stray into the 'new economy' debate.

Castells traces the emergence of the 'information age' to the period of economic crisis in the 1970s, which marked the end of what has often been referred to as the 'post-war' settlement (Webster 1997: 71). By taking this period as his starting point, Castells recognises that he is entering similar territory to that covered by:

'well-established tradition in theories of postindustrialism and informationalism, starting with Alain Touraine and Daniel Bell, [of placing] the distinction between pre-industrialism, industrialism, and informationalism (or postindustrialism) on a different axis than the one opposing capitalism and statism (or collectivism, in Bell's terms).[in order to] maintain analytical distance and empirical interrelation between modes of production (capitalist, statism) and modes of development (industrialism, informationalism)'.

Castells (1996: 14)

Castells takes great pains to acknowledge the affinities between the theoretical and empirical basis of Bell's analysis of the contribution of theoretical knowledge to the development of the post industrial society and his own analysis of the contribution of information to the development of networked societies (Castells 1996:14). He demonstrates his indebtedness to Bell in three ways. First, he acknowledges Bell as a 'forebear of informationalism' (Castells (1996: 26). Second, he adopts explicitly Bell's definition of knowledge as set of organised statements of facts or ideas that have been worked up through a process of reasoned judgement or empirical study and communicated in some systematic form:

'I have no compelling reason to improve on Daniel Bell's own definition of knowledge'.

Castells (1996: 17)

Third, he consolidates his debt to Bell's fairly traditional conception of knowledge by adopting a definition of information that is more or less congruent with Bell's use of the term. Castells (1996: 17) defines information as 'data that have been organised and communicated'. Castells, however, relates the increased demand for knowledge and information and also its increased production) to the revolution that has occurred in information and technology.

Although he acknowledges the key role of science in generating the theories and concepts that are responsible for the 'technology revolution' (Castells 2000: 6-7), Castells, is chiefly concerned with: 'the secondary elaboration of data (information) rather than its genesis in scientific activity' (Muller 2001: 287).

Castells (2000:30) is interested in the continued application of science in the form of technology) of information because the period of economic restructuring that occurred from the 1970s onwards coincided with tremendous advances in computing technology. There are similarities between his views and Bell's view of technological change because Castells accepted Bell's definitions of technology as (1996: 30) 'the use of scientific knowledge to specify ways of doing things in a reproducible manner'.

However, by virtue of the fact that he was writing twenty years after Bell, Castells focuses on the impact of information and communication technology on society rather than on the automation of production. In common with other writers (Forrester 1985; Lash and Urry 1994) Castells argued that information and communication technology (ICT) was characterised by:

> 'incomparable memory storage capacity and speed of combination and transmission of bits.... [thus, they offer] ... substantially greater flexibility, feedback, interaction and reconfiguration of data [and] on-line communication, combined with flexibility of text, allows for ubiquitous space/time programming'.
>
> Castells (2000:30)

It is the knowledge and information (Castells often uses the terms interchangeably or together, i.e. as 'knowledge-based information', generated by information and communication technology that constitutes the critical resource to transform economic activity.

Information as the mode of development

Castells, like Bell, insists that social and economic change can be analysed by looking at the relationship between production and development (Webster

(1997b: 79). He contrasts the Marxist concept of the capitalist mode of production with his own concept of the 'informational mode of development' which he claims is the defining characteristic of the information age.

A dual shift has occurred, according to Castells, in capitalist economies. The first is the move away from a mode of production whose primary aim was to maximise output in order to produce surplus profit, towards a new sociotechnical paradigm - an 'informational mode of development' (Castells 1996: 61-65). Castells claims that this presents modern economies with a new way of creating a given level of wealth because it is based upon new principles that have led to changes in the organisation of work.

The second shift is that, whereas industrialism was focussed on maximising output, informationalism is focused on technological development and the generation of data. In other words, 'informationalism' is concerned with the accumulation of wealth through the continuous transformation of existing technologies themselves and through the generation of data that can be used to enhance the performance of those technologies. Informationalism presupposes the constant development of knowledge. This process, according to Castells (1996: 17), not only supports technological innovation, the ever increasing application of technology and higher levels of complexity in information processing but also supports increased productivity and profitability[6].

In both the first and second editions of the *Networked Society,* Castells tries to identify the defining characteristics of the informational paradigm, He rests his case on five specific features of the new information and communication

6 In developing his ideas about the new informational mode of development, Castells drew extensively on the socio-economic forecasting tradition that is associated with Freeman (1990; 1988), Dosi (1988) and Perez (1983). One of the main assumptions these writers make is that changes in economic activity are determined by changes in the underpinning technological structure. For Freeman and his colleague, the changes that were occurring in advanced industrial societies represented a shift from a technology based on cheap inputs of energy to one predominantly based on cheap inputs of information derived from advances in microelectronics and telecommunications technology (Freeman 1988: 10)

technologies. The features of these new technologies can be summarised as follows. They:

- act on information, the new raw material of economic activity, not just technology as in earlier technological revolutions;
- are pervasive, they become an integral part of all human activity since all processes (i.e. economic, social, cultural, political) are shaped by the new technology;
- extend the possibility of the networking logic to all parts of the economy;
- can be used flexibly, thus allowing organisations to fundamentally alter, rearrange and modify technological components;
- engender industrial and technological convergence, since new integrated information systems are emerging that embodied computing and telecommunication technology and are leading to the creation of new industries, new products and new forms of knowledge.

(sumarised from Castells 1996: 61; 2000; 70-71)

Hence Castells argues that the new information technologies provide the technological basis for a new type of economy. Initially, in the first edition of *The Rise of the Networked Society,* he claimed this new economy had two intertwined and distinguishing features. First, it was *informational.* The productivity of the units or agents in this economy, whether firms, regions or nations, fundamentally depends on their capacity to generate, process and apply knowledge-based information efficiently (Castells 1996: 66). Castells suggests that this involves finding ways to realise more of the productive potential in either mature industries and economic activities, such as car manufacturing (Castells 1996: 47) or in emerging scientific fields, such as genetic engineering (Castells 1996: 47-50). Second, it was *global* because the core activities of production, consumption, and circulation, as well as their components - capital, labour, raw materials management, information technology and markets - were organised on a global scale.

In the second edition of the book, Castell's introduces a third feature by explicitly developing a theme that was an implicit feature of his earlier argument. He argues that the new economy is also a *networked* economy because in the new informational paradigm, productivity is generated through, and played out in, a global network of interaction and not in a national context. He acknowledges, however, that this informational and networked pattern is not developing equally around the world; it remains an inherently uneven phenomenon often exacerbating existing differences between regional economies (Calhoun 2000: 35).

One of the defining features of the new paradigm in Castells (1996: 67) view is that the products of the new information technology industries are information processing devices or information processing itself: 'the action of knowledge upon knowledge itself (is now) the main source of productivity'.

Thus, from his perspective, a decisive shift has occurred in the nature of economic activity and the role of knowledge within that activity. However, instead of perceiving economic activity as relying on the theoretical knowledge produced in universities and research institutes, as Bell postulated, Castells introduces a new focus. He argues that economic activity is inextricably tied up with the tremendous advances that are continually occurring in information processing technology. Information processing, as he explains, focuses on:

'improving the technology of information processing as a source of productivity, in a virtuous circle of interaction between the knowledge sources of technology and the application of technology to improve knowledge generation and information processing'.

Castells (1996: 17)

The result, for Castells, is that the spatial and temporal nature of work is being profoundly transformed because the new technologies serve as a conduit to transmit and process information in a fairly unproblematic way[7]. This flow of

[7] One of the main reasons why Castells often conflates knowledge and information throughout the three volumes of the Information Age is that he is mainly interested in identifying the economic

knowledge and information within and between networks allows people to develop new ways of organising and arranging wealth.

To summarise, Castells uses three interconnected concepts, informationalism, globalisation and networks, in his analysis of modern societies and these ideas continue to be central to debates about economic and social development (Muller 2000). This is partly because Castells has provided a compelling series of metaphors for exploring the contribution of education to economic development and the complex relationship between them. It is also partly because his metaphors resonate with the arguments about the increased role of knowledge-based work in 'networked' societies. To explore this issue, the chapter turns to the work of Nico Stehr.

Knowledge, knowledge societies and knowledge work

Knowledge as a 'capacity for action' and its implications for knowledge work

Stehr's (1994: 1-2) aim was to develop a general sociological theory about the role of knowledge within society. In particular, he was keen to explore how knowledge can provide a 'continuous enlargement' of human action in modern societies (Stehr 1994: 17). Stehr acknowledges Bell's influence on his thinking with respect to providing an explanation about how the knowledge-producing sector attained decisive importance (Stehr 1994: 14). Echoing Bell and Castells, Stehr also argues that knowledge, rather than land, labour and capital, has become the leading factor in the process of production, the primary condition for its further expansion as well as for the limits to growth in the global economy. Stehr does not mean to convey that there has been some kind of abolition of material production in advanced industrial societies. His concern is to draw attention to the transformations that are continuing to occur in the structure of societies, the nature of economic activity and in the nature of work.

effects of knowledge/information. Thus, he never discusses the social practices that enable knowledge/information to support economic development: an issue that will be addressed in Chapter 4.

Stehr (1994) claims that to account for the conditions that enable knowledge to be represented symbolically (i.e. represented in the form of text, graphics etc.) or provide the possibility for objectified knowledge, it is necessary to develop a 'sociological' conception of knowledge. He is also concerned that this conception of knowledge indicates how individuals and groups use cultural resources to either produce further knowledge or to transform their own specific social and cultural circumstances:

'the social significance of language, writing, printing, data storage etc, is that they represent knowledge symbolically or provide the possibility of objective knowledge. Thus, most of what we today call knowledge and learning is not direct knowledge of facts, rules and things but objectified knowledge....the highly differentiated stock of intellectually appropriated nature and society which may be seen to constitute the cultural resource of a society'.

Stehr (1994: 93)

The conception of knowledge Stehr advances is greatly influenced by the sociological tradition of social action (Giddens 1984; Simmel 1907; Weber 1922), which has viewed the capacity humans have for interpretation as the main basis for their action in the world. This influence leads Stehr (1994: 95) to:

'define knowledge as a *capacity for social action.* In this sense, knowledge is a universal phenomenon or an anthropological constant'.

From this perspective, the acquisition or possession of knowledge becomes a condition for the possibility of social action. Stehr argues that, in order to realise this possibility, it is necessary to identify the way in which knowledge comes to be expanded and the contribution that skilled specialist workers make to this process. Nevertheless, Stehr recognises that although knowledge is inextricably linked to action, knowledge can serve functional or irrational ends:

'The notion of knowledge as a capacity for social action has the advantage, it seems to me, that it enables one to stress not merely one-sided (i.e. functional) but multi-faceted consequences of knowledge for action'.

Stehr (1994: 96)

The application of knowledge to create new products and services is inevitably influenced by the specific social and intellectual conditions in which it is embedded. Unlike Bell and Castells who assume that knowledge or information carry a constant and fixed value enabling different types of actors to translate and employ it for identical purposes and for closely similar outcomes. Stehr, recognises that (1994: 96):

> 'In as much as the realisation of knowledge is dependent on the active elaboration of knowledge as a capacity for action within specific social conditions, a first link between knowledge and social power becomes evident because the control of the relevant conditions requires social power'.
>
> Stehr (1994: 96)

Scientific knowledge represents, for Stehr, a paradigmatic example of a 'capacity for action'. Its special importance in advanced industrial societies is that it constitutes, more than any other form of modern knowledge: an *incremental* capacity for social action or an increase in the ability of 'how-to-do-it' which may be privately appropriated, if only temporarily' (Stehr 1994: 97). The great strength of scientific knowledge is, therefore, that it can not only result in marginal or major additions to the generally available stock of knowledge, but it can also be used to develop new products and services.

This contribution that science makes to society is characterised by Stehr (1994: 44) as an 'immediately productive force'. By this he means that the range of knowledge science makes available, coupled with the fact that science becomes increasingly the only source of additional knowledge, dramatically enlarges the available options for social action. Stehr maintains that science and scientific research is no longer applied, as Bell argued, to the organisation of production, rather society itself is organised to support the further production and application of scientific knowledge. For Stehr, the outcomes of scientific research (for example, the data and systems that emerge from those disciplines) produce and reproduce the knowledge structure of society and he describes this process as the 'scientisation' of production and consumption. Thus, from his perspective science has now penetrated into every sphere of

modern society and has fundamentally altered the texture of social and cultural life as well as transforming the process of production.

One of the consequences of the scientisation of the economy has been the cumulative demand for more and more specialised knowledge-based products, and services. It has resulted in the growth of what Stehr (1994: 179) following Machlup, refers to as 'knowledge work' and 'knowledge-based occupations'. These terms were originally introduced by Machlup in the early 1960s to defined those forms of work, which were responsible for producing and transmitting types of knowledge that helped people to learn something they had not known previously. For Stehr, Machlup's definition of was far too broad, leading him to count clerical workers as a 'knowledge worker'. Stehr questions whether it is meaningful to count, clerical or similar types of work as knowledge work without differentiating the extent to which the work involved the production of new theoretical knowledge as opposed to accumulating additional information in a given occupational field.

To differentiate 'knowledge workers' from other types of workers by focusing on the whole context of knowledge work, such as its principles of application, rather than broad-based measures, such as job descriptions, Stehr (1994: 183), in common with Giddens, defines 'knowledge work' in terms of those who:

'consult, provide guidance to others, counsel, or give expert advice, as the group of occupations engaged in the *transmitting* and *applying* of knowledge'.

This definition is consistent with his idea that knowledge constitutes a 'capacity for action' in two senses: we use the principles that underpin the technical content of knowledge work to guide the transmission of knowledge and to assist us apply our interpretation of the meaning of that knowledge. One of the characteristics of knowledge work is the growth of specialist fields of expertise, this implies that solutions to problems require professional collaboration which, in turn presupposes one form of expertise being passed on to assist another expert to resolve the dilemmas they confront. Thus, Stehr implies, it is

a fairly technical matter to explain new knowledge to professional or lay communities or to relate one form of knowledge to another.

Conclusion

This chapter has discussed a number of new concepts such as, 'post-industrial society', 'network society' and 'knowledge society' and new ideas about the role of knowledge in the economy that Bell, Castells and Stehr developed to explain the new type of societies which they claimed were emerging. It noted that although these social theorists have been influenced by quite different theoretical traditions and concerned with rather different questions about the role of knowledge, the *sine qua non* of their respective analyses is that science is the critical form of knowledge for economic development.

The emphasis on the primacy of science as the critical resource within the knowledge economy is, however, hotly contested in other branches of the social sciences. For that reason, the next chapter discusses the work of a number of management theorists who have affirmed that the tacit knowledge is, at least as important as science to economic development.

Chapter 3

The role of tacit knowledge in the economies of advanced industrial societies

Introduction

In clarifying the role of scientific knowledge in advanced economies, Chapter 2 argued that Bell, Castells and Stehr, albeit in slightly different ways, all claim that scientific knowledge is the key factor in economic development. The aim of this chapter is to discuss the alternative view that gives primacy to the role of tacit knowledge rather than science in the economies of advanced industrial societies. This view has its origins in the field of management studies[1] and the chapter discusses three possible expressions of the role of tacit knowledge in the economy. The first is the emergence of a much more pluralistic mode of knowledge, which is influenced and determined by commercial considerations as much as the application of scientific principles of inquiry production of new forms of scientific knowledge. Following Gibbons *et al* (1994) can be referred to as 'Mode 2' or 'transdisciplinary' knowledge[2].

The second expression reflects a continuation of this pluralism, namely the argument that organisations constitute sites for knowledge production because there is an 'epistemological dimension' to their activities (Nonaka and Takeuchi 1995: 56). This view assumes that one of the challenges facing organisations in the knowledge economy is to innovate continuously and that the tacit knowledge held by organisational 'communities of practice' (Brown and Duguid

[1] I have employed this term to indicate a commonality in approach in the work of all the theorists discussed in this chapter: the implications of tacit knowledge for economic and organisational development.

1991) about product and service design and delivery constitutes a resource as important as science in supporting innovation.

The third expression reflects a neglected dimension of Gibbons's *et al.* and Nonaka's and Takeuchi's argument about tacit knowledge. The chapter argues that tacit knowledge is not, as Gibbons *et al.* Nonaka and Takeuchi often imply, an anthropologically invariant form of knowledge: it is shaped and developed by the relationship between our prior knowledge and the cultural tools we are using at any particular point in time. The chapter explores the implication of this observation through a discussion of Zuboff's (1988) study of the deployment of information and communication technology in workplaces and the role of tacit knowledge and skill in this process.

New modes of knowledge production

Background

It has been widely acknowledged in social theory and science studies, that in the past half-century the relationship between science and society has begun to change (Fuller 1997; Osborne 2001)[3]. Instead of assuming science was separate from society, governed by its own norms, values and methods of inquiry and that it constituted the major source of enlightenment[4], it has been gradually accepted that science is inextricably connected to society. The idea of 'scientific enlightenment', has been subject to criticism from inside and outside the scientific community, and increasingly science is conceived of more modest terms (Osborne (1998: 43).

[2] There is some evidence that it is less the case that Mode 2 is a new type of knowledge and more the case that it is an intensification of a trend to explicitly combine science (and other forms of theoretical knowledge) with tacit knowledge to address commercial pressures (Shin 1999).

[3] It is important to note that the consensuality and consensibility that these writers attribute to the status of science and scientific findings within the scientific community and more widely within society is a particular characteristic of the post-World War era. There is considerable evidence that scientific findings were hotly contested in the eighteenth and nineteenth centuries.

[4] That is, in the terms of the kind of knowledge science makes available and kinds of method of inquiry it advocates.

The reasons for this change in the status of science can be summarised as follows. First, the formation of a tripartite alliance[5], often referred to as the 'triple helix' (Etzkowitz *et al.* 1994), between universities, industry and the state has significantly broadened the range of interest groups that are concerned with the production of knowledge in advanced industrial societies. Second, the process of globalisation has placed a far greater emphasis upon the 'performativity' (Lyotard 1988) of knowledge, that is, the instrumental capacity of knowledge to address everyday problems. These developments have made the new research partnerships and the forms of knowledge they develop more responsive to the demands of business (Shin 1999: 152). Third, the increased 'risks' associated with the commercial exploitation of science and technology have led societies to become more distrustful of science and to contest its knowledge claims (Beck 1992).

A manifestation of this new relationship between science and society has been the significant changes in the organisation of certain aspects of science and research practice. Michael Gibbons and his colleagues have provided in their book *The New Production of Knowledge* (1994) the most widely debated account of this type of change. The authors state the book's core thesis in the following terms:

> 'the parallel expansion in the number of potential knowledge producers on the supply side and the expansion of the requirements of specialist knowledge on the demand side are creating the conditions for the emergence of a new mode of knowledge production.'
>
> Gibbons *et al.* (1994: 13)

Gibbons and colleagues (1994) propose that a process of de-differentiation has been occurring between science and non-science spheres. They claim that one of the outcomes of this process is that science has begun to lose its distinctive

[5] The development of the 'triple helix' has some affinities with the development of close links between universities and industries that occurred in nineteenth-century Germany. Both developments shared a concern to ensure knowledge production supported economic development. The German developments, however, were based on the principle of a state-led economy whereas the triple helix refers to the extension of the principles of 'marketisation' into the university.

cognitive and institutional character and, in the process, a new organising principle for the production of knowledge has been generated. This development, according to Gibbons *et al.* is fundamentally transforming the relationships between universities, government research institutes and private industrial laboratories[6]

The concern of this chapter is to highlight the way in which *The New Production of Knowledge* advances an alternative conceptualisation of the role of knowledge in the economies of advanced industrial societies compared with the ideas of Bell, Castells and Stehr. A conceptualisation that affirms the importance of tacit knowledge to the production of goods and services in the knowledge economy

The emergence of a new mode of knowledge

Gibbons *et al.* distinguish between two modes of the production of knowledge, which they refer to as Mode 1 and Mode 2. The former has traditionally been associated with disciplinary-based research conducted in universities, while the latter is a mode of knowledge production carried out outside universities based on teams of university and business researchers that creates a new type of knowledge that incorporates theoretical insights from many hence the idea of trans disciplines and insights gleaned from practical experience[7]. For Gibbons *et al.* (1994: 2), Mode 1, refers to a form of knowledge production that has grown up to:

[6] The New Production of Knowledge has received a very mixed response among academics. It has been perceived as proposing a radically new relationship between science and society and a new role for science in the economy (Muller 2001) and a new relationship between university science departments and the commercial world (Jacob and Hellstrom 1999). Trenchant criticisms, however, have also been levelled against the Mode 2 thesis. It has been derided as an overstated statement of the 'finalization' thesis of the 1970s (Weingart 1997), which ventured that as sciences mature their potential for relevant application increases. Furthermore, it has been argued that there is minimal evidence that Mode 2 is starting to supersede traditional scientific research, that the characteristics of transdisciplinarity are far from clear (Rip 1997; Shin 1999) and that the concept may be more prevalent in some branches of science compared with others (Muller 2000).

[7] Before proceeding to discussi the differences between Mode 1 and Mode 2, it is important to distinguish transdisciplinary from multi-disciplinary knowledge production. The latter refers to the formation of new hybrid disciplines, which has been occurring in universities for some time. It involves the combination of different disciplines. Examples can be found in the humanities (for example, the emergence of cultural studies from sociology and literary criticism) and in the sciences (biochemistry and biophysics were both developed from biology, chemistry and physics).

'control the diffusion of the Newton model [of science] to more and more fields of enquiry and to ensure its compliance with what is considered to be sound scientific practice'.

Thus, it follows that Mode 1 is a convenient - albeit oversimplified - way to summarise the cognitive and social norms that have traditionally influenced the production, legitimation and diffusion of scientific knowledge.

For Gibbons *et al.* (1994: 2-3), Mode 1 has been characterised historically by the following features. First, problems have been set and solved in a context that is governed by the academic community alone. Second, Mode 1 seeks constantly to accumulate more knowledge in a given field either through building on or adding to the existing stock of knowledge in terms agreed within a particular discipline (i.e. mathematics, physics, chemistry) and, for this reason, Mode 1 tends to preserve its own highly distinctive form. Third, Mode 1 knowledge has been characterised historically by a high degree of homogeneity of knowledge producers because most of those who were responsible for this form of knowledge production were pursuing academic careers. Fourth, the standards of scientific excellence have been decided in accordance with a process of rigorous, anonymous academic peer review as the main form of public accountability.

In contrast, Gibbons *et al.* employ the term Mode 2 to describe the mode of production of knowledge that they claim is now being developed in advanced industrial societies to support economic, social and political changes. Mode 2 knowledge can be distinguished from Mode 1 knowledge in a number of ways. The first way is that Mode 2 knowledge is produced in a 'context of application'; by this Gibbons (1994: 19) and colleagues mean, a situation:

'where knowledge is developed for and put to use, while results - which would have traditionally been characterised as applied - fuel further theoretical advances'.

Moreover, the actual process of research is guided by principles of design originally developed in an industrial context, rather than traditional scientific inquiry, because the outcome of the knowledge production process is a form of technologically contextualised knowledge. Contexts of application are defined by a process of continuous negotiation of the needs, interests and specifications of all stakeholders, including universities, industry and government. The main issue is whether the knowledge that is produced has a utility value that meets the needs of the interest groups which were involved in negotiating the original research specification (Jacob and Hellstrom 2000).

A second way Gibbons *et al.* argue that the production of Mode 2 knowledge is distinctively different from Mode 1, is that it involves teams of diverse specialists whose intellectual agenda is not set by a particular discipline. Mode 2 generates its own distinctive theoretical structures, research methods and modes of practice. Moreover, the solution to problems can be both empirical and conceptual (though not necessarily based on disciplinary knowledge) and results are communicated as practitioners move from one context of application (i.e. membership of a research team or an area of production) to another (Gibbons *et al.* 1994: 5). A classic example of Mode 2 knowledge production according to Gibbons *et al.* (1994 20-2) would be the links that have been established between the aeronautical industry and university-based physics departments in the attempt to build a 'hypersonic aircraft'. The success of this project depends on solving the problem of propulsion generated by an aerobic motors that 'uses air as the combustant rather than oxygen mass'. The formulation of the research agenda to address this issue cannot be understood, as Gibbons *et al.* 1994: 20) observe, without paying attention to prior developments in technology, which structure the context of application.

To illustrate the challenge of producing knowledge in its context of application, Gibbons *et al.* (1994: 24) distinguish between 'codified' and 'tacit' knowledge[8]. This

[8] Polanyi (1966) distinguished between 'formalised' knowledge and 'tacit' knowledge. The former referred to those forms of knowledge that were transmittable in formal systematic or codified languages.

distinction was originally coined by Polanyi (1958) to indicate the philosophical limitations of conceiving of scientific knowledge in purely abstract, formal terms. Gibbons *et al* do not explicate the way in which they have chosen to interpret Polanyi's original distinctions; they simply proceed to use the terms 'codified' and 'tacit' to clarify what they perceive as distinctive about Mode 2 knowledge. They define codified knowledge as the systematically organised, stored and retrievable forms of knowledge, which can be represented by disciplinary knowledge, a form of operational knowledge expressed in protocols and manuals or the proprietary knowledge that is subject to licensing and commercialisation (Gibbons *et al.* 1994:22). Tacit knowledge, on the other hand, is defined as the form of personal knowledge gained from experience of work and held by professions working in transdisciplinary teams. Gibbons *et al.* maintain (1994: 24) that increasingly in the knowledge economy 'the competitive advantage of a firm lies less in its pool of proprietary knowledge than on its base of tacit knowledge.'

A third way in which the dynamics of Mode 2 knowledge production are different from Mode 1 is as a result of the new type of research activity associated with working in a context of application. Research entails, according to drawing on:

> 'a diverse array of knowledge resources and configuring them according to the problem in hand [and there can] be more than one view as to the best way to proceed and such divergences may fuel a process of competition'.
>
> Gibbons *et al.* (1994: 27)

Thus, unlike Mode 1 knowledge, which tends to grow homogeneously through the acquisition of more knowledge in the same disciplinary field, Mode 2 knowledge grows heterogeneously since the tacit knowledge held by communities of professionals constitutes the critical resource for its production.

The latter referred to the type of knowledge that was acquired by people as they created and organised their own experience. According to Polyani, neither form of knowledge was reducible to the other.

A further way that Mode 2 is different is that in many instances firms are the sites for research and development. Gibbons *et al.* (1994: 25) note that commercial applications are developed in the main in companies or business units rather than universities. This development means that firms have to: 'configure the competence of individuals into a distinct, firm-specific knowledge base which will form the core of its capability to compete in national and international markets'.

The emergence of Mode 2 and the emphasis on tacit knowledge shifts the locus of research and development. Instead of R & D being viewed as an exogenous process, carried on outside firms either in partnership with universities or separately from firms, R & D is now conceived as an 'endogenous'[9] process, that is, carried out inside firms and not necessarily involving universities. The challenge that firms confront surviving in the global economy involves:

> 'not merely the reallocation of existing resources... but through experiment discovering configurations of knowledge which convey a commercial advantage on a recurrent basis. In this process new knowledge is created which provides the base for the next set of advances (in the design and delivery of products and services.'
>
> Gibbons *et al.* (1994:68)

Tacit knowledge and organisational development

Firms as sites for knowledge production

The idea that firms constitute sites for innovation started to surface in management science (Drucker 1969), organisational science (Penrose 1959) and evolutionary

[9] The idea that endogenous forms of innovation made significant contributions to economic prosperity first surfaced in the school of economics that has been called 'new growth theory' (Romer 1986). The proponents of new growth theory argued that economic 'spillovers' and increasing returns constituted the fundamental sources of growth. New growth theory highlighted, in particular, that non-traditional forms of capital investment, such as company-based and company-resourced research and development, are prime examples of the types of investment that are associated with increasing returns or spillovers.

economics (Nelson and Winter 1972) in the 1960s[10]. Up to then, most theories of the firm had been rooted in the 'transaction costs' school of business economics (Coase 1937). From this perspective, the cost of market entry and purchasing new technology (i.e. the transaction cost) was portrayed as more critical to economic success than research and development. Thus, the dominant idea of the firm from the 1940s onwards tended to reinforce the idea that a firm's competitive success was dependent on controlling its transaction costs.

By focussing on firms' behaviour, writers were able to highlight the limitations of the 'transaction-cost' theory and the assumptions it made about firms. Penrose (1959: 67-87) argued that resources (for example finance, research and development) were never by themselves the most important 'inputs' in the production process, rather it was the services that resources rendered firms. Firms' competitive success was determined, according to Penrose, by their ability to use 'latent' knowledge. By this she meant knowledge about under-utilisation of resources or ideas as to how to specialise and extend the product and service range, how to reconfigure productivity or how to enhance productive operations. Penrose suggested, therefore, that firms should be viewed as repositories of knowledge. This idea was developed further by Nelson and Winter (1972) who pointed out that firms were repositories of quite specific types of knowledge and that depending on the idiosyncratic nature of that knowledge, even firms in similar lines of business could produce vastly superior or inferior products or services, and experience radically different fortunes.

One result of the increased attention on firms' responses to changing market conditions and evolving customer trends and preferences has been the focus on the 'epistemological dimension' to firms' activities (Nonaka and Takeuchi 1995). Epistemology is normally used in the Human, Social and Natural Sciences to refer

[10] Writers in other fields, such as, business economics (Boisot 1998) and economic and innovation theory (Foray and Lundvall 1996) have also explored this issue.

to the study of the philosophical foundations on which knowledge in different disciplines stand. However, two related arguments have been advanced to support the contention that there is an 'epistemological dimension' to firms' activities.

The first argument reflects a continuation of the more pluralistic view of knowledge discussed at the start of this chapter. This locates the process of knowledge creation in terms of peoples' active engagement with the world rather than being only associated with a highly specialised activity occurring in laboratories that results in the gradual unveiling of the mysteries of the natural world (Spender 1998: 233). The second argument builds on the premises of the first. If people, and hence firms, develop knowledge through the way in which they engage actively with the world, it is important to identify the repertoire of strategies, processes and activities that enable knowledge to be generated, shared and applied (Spender 1998: 234).

Thus, both arguments imply that one of the ways that firms contribute to knowledge economies is through contributing to the wider stock of ideas about what constitutes knowledge creation and knowledge sharing in contexts other than the laboratory (Nonaka and Takeuchi 1995: 49-50).

'When organisations innovate they do not simply process information, from the outside in, in order to solve existing problems and adapt to a changing environment. They actually create new knowledge and information, from the inside out, in order to redefine both problems and solutions and, in the process, to re-create their environment'.

Nonaka and Takeuchi (1995: 56)

Innovation is, therefore, a process of problem identification and problem-solving that occurs inside firms. Throughout the 1990s, there were a series of attempts in management and organisational science to develop conceptual frameworks that tried to illuminate this issue. It is widely accepted within management theory that the pre-eminent exposition of the way in which knowledge is created inside orgnaisations has been provided by Nonaka and Takeuchi (1995).

Tacit knowledge and knowledge production

Nonaka and Takeuchi (1995: 32) ground their discussion of the creation of new knowledge within organisations explicitly in terms of the dualism between mind and world. They argue that the history of western organizational thought, from Alfred Marshall to Peter Senge, can be seen as repeated challenges to the 'scientific' view of knowledge by the 'humanistic' one.

Moreover, they maintain that by framing the debate in terms of this dualism, irrespective as to which epistemological position is adopted, organisational theorists have largely concentrated on identifying the contribution that 'existing' knowledge, usually science, makes to innovation, organisational development and wealth creation. In contrast, Nonaka and Takeuchi (1995: 49) argue that the challenge for all organisations in the knowledge economy is to innovate continually through creating new knowledge. Whereas the scientific view assumed that scientific methods were the sole source of the production of new knowledge, Nonaka and Takeuchi (1995: 60) maintain that the reservoir of 'subjective, bodily, and tacit aspects of knowledge' held by individuals in workplaces is an inescapable element in this new knowledge'.

Thus, according to Nonaka and Takeuchi, tacit knowledge is an embodied and intuitive form of knowledge that we accumulate through practical experience and which constitutes the basis of our personal and professional judgements. We can only share our tacit understandings, according to Nonaka and Takeuchi, by developing 'mental models'. By this they mean pictures or patterns that represent the significance of our experiences and it is through the sharing of such mental models that we are able to begin to transform the production process.

The origin of this theory of knowledge conversion, that is, the process of making the implicit meaning explicit, lies in the 'Japanese Intellectual Tradition' (Nonaka and Takeuchi 1995: 27). They define the main features of this tradition in terms of

the following three assumptions: the oneness of 'humanity and nature'; the oneness of 'body and mind'; the oneness of 'self and other'. They argue that one of the dominant features of this tradition is the Zen Buddhist belief in the use of 'question-and-answer conversations' to clarify understanding of paradoxical issues (Nonaka and Takeuchi 1995: 30). They suggest that this is akin to people coming to understand themselves more fully by undertaking a 'journey' that allows them to acquire a new perspective, a new view of the world and, ultimately, new knowledge. Nonaka and Takeuchi (1995:56) maintain that the:

'cornerstone of our epistemology is the distinction between tacit and explicit knowledge.[and that] the key to knowledge creation lies in the mobilisation and conversion of tacit knowledge'.

Drawing on their extensive experience of supporting the 'journey' of Japanese companies, such as Toyota, Honda, which were engaged in 'new product development' Nonaka and Takeuchi (1995: 56-70) define their definition of knowledge creation in firms as a spiraling of interactions between explicit and tacit knowledge. The primary purpose of these interactions is to turn tacit knowledge about products, services and systems, into explicit knowledge. In other words, these processes allow this tacit knowledge to be shared and become part of the wider repertoire of knowledge held by all members of an organisation and, in the process, create new knowledge. Nonaka and Takeuchi suggest that this new knowledge could take the form of either an entirely new product or service or a significant modification to existing ones.

They draw on Polanyi's ideas to counter the traditional view of epistemology, which is that we acquire knowledge through analysing external objects, in order to develop an alternative conception of knowledge production. Nonaka and Takeuchi (1995: 60) argue that we actively create and organise our own experiences:

'by involving ourselves with objects, that is, through self-involvement and commitment. [Hence] To know something is to tacitly integrate its particulars '.

For Nonaka and Takeuchi (1995:62-9), new knowledge emerges from the continuous interaction between the stock of 'codified' ideas that determine the process of production such as operating manuals, protocols and our practical experience of applying these guidelines.

The process of creating new knowledge from the interaction between codified and tacit knowledge involves four phases. In the first phase, tacit knowledge is formed as we share experiences through the creation of 'mental models and technical skills'. In the second phase explicit knowledge is created through:

> 'articulating tacit knowledge into explicit concepts'. It is a quintessential knowledge-creation process in that tacit knowledge becomes explicit the shape of metaphors, analogies, concepts, hypotheses or models'.
>
> Nonaka and Takeuchi (1995: 64).

In the third phase, different types of explicit knowledge are combined through a process of 'systemising concepts' (i.e. the common understandings that have been built up) into a 'knowledge system' to construct a body of knowledge that can be used to reconfigure the process of design and/or production. The final phase involves the operationalisation and internalisation of the knowledge that will allow an organisation to create a new product through a 'process of embodying explicit knowledge into tacit knowledge'. By this they mean the new form of explicit knowledge has to be applied within the production process and, in the process, it becomes converted back into a new form of tacit knowledge.

The spiral of interaction, which Nonaka and Takeuchi (1995: 62-72) claim is a universal characteristic of firm-based knowledge creation, is a dynamic process that amplifies the knowledge created in each phase. They maintain that the spiral of knowledge creation is a never-ending process which is gradually embedded in

organisational routines through the creation of special environments to assist people in producing new products and services (Nonaka and Konno 1998).

The common link between Nonaka and Takeuchi and Gibbons and colleagues ideas about tacit knowledge is that both writers adopt an anthropological stance towards tacit knowledge. This means that they assume that tacit knowledge is the invariant product of our engagement with the world which is susceptible to being formalised and shared, in so doing, they do not explore whether tacit knowledge is historically, culturally and technologically rooted.

The multi-faceted basis of tacit knowledge

Tacit knowledge and technology

One way to explore the multi-faceted nature of tacit knowledge is to identify the conditions that facilitate the development of different modes of tacit knowledge in different contexts. This issue is tackled through a discussion of Shoshana Zuboff's (1988) account of the relationship between tacit knowledge and new technology in her book *In the Age of the Smart Machine*. This book is one of the most widely celebrated, detailed and theoretically suggestive studies of how the deployment of information and communication technology can transform the nature of work and skill (Orlinkowski 1992; Martin and Scribner 1991; Webster and Robbins 2000). Even though it was written over fifteen years ago, it still provides a conceptually sophisticated account of the relationship between work, technology and skill. Not least because it addresses issues about the relation between ICT, skill and knowledge that are not touched on in Castells' trilogy on the networked society, even though her book was written first.

Zuboff analysed information and communication technology (ICT) in the context of its implementation by taking explicit account of how organisational context, managerial intent and work structures influence the deployment of information

technology in firms (Orlikowski 1992: 400-01). This approach allowed her to identify the way in which the introduction of ICT can fundamentally alter the nature of knowledge and skill at work. In doing so, Zuboff sheds light on the issues about tacit knowledge that are underdeveloped in the work of Gibbons *et al* and Nonaka and Takeuchi, specifically the way in which different conditions foster the development of different types of tacit knowledge[11].

The starting point of Zuboff's argument is that the effects of the replacement of machine technology by ICT on human skill has resulted in a shift from one 'quality of knowing' to another (Zuboff (1988:56-7). The former was a sentient, embedded and experienced-based quality, while the latter is a sapiental form of knowledge that demands an explicit form of knowing based on analysis, questioning and constant reformulation.

Zuboff introduced the concepts 'action-centred skill' and 'intellective skill' to encapsulate the nature of the different types of knowledge and skill required for working with machine technology compared with working with information technology. The former refers to an 'experiential' mode of skill formation that has been typically associated with industrial workers prior to the introduction of ICT. Zuboff identified four key aspects of such action-centred skill. It was (i) dependent upon 'sentience' (that is, the use of information that could be derived from physical clues); (ii) developed through 'action-dependence' (in other words, developed through physical activity); (iii) only meaningful in 'context-dependent' situations (those specific situations where the work occurred); (iv) dependent on being 'personalised' (that is, a linkage existed between the knower and the known that is 'felt' by the knower).

[11] My interpretation of Zuboff is very different from how her text has been perceived by many other social scientists. I have focused on her ideas about how different conditions foster the development of different types of tacit knowledge whereas many other writers have concentrated on the implications of her analysis for the organisation of work.

Acquiring 'action-centred skill' requires a specific type of cognitive activity (Zuboff 1988:73). The process of learning skills, remembering skills and displaying skills, means that the knowledge held by individuals does not have to be made explicit. The knowledge and understanding derived from manipulating materials or observing the physical performance of machines is implicit or tacit and used by individuals to orientate actions or to signal impending problems. In contrast, Zuboff employed the term 'intellective skills' to refer to the mode of thinking that is required when working in computer-mediated environments. The main difference between these types of skill is that the former involves the interpretation of symbolic data, as Zuboff observed (1988: 76) 'in a symbolic medium, meaning is not a given value, rather, it must be constructed'. Thus, where activities involve the use of a symbolic medium (for example, interaction with a computer screen and interpretation of the data it provides) far greater emphasis is placed on our capacity to handle abstract data, to draw explicit inferences from such data and to engage in procedural reasoning.

Zuboff argued that information and communication technology is not a neutral technology. She pointed out that organisations' strategic decisions influence the pattern of implementation and the type of skills workers develop. To illustrate the implications of her analysis, Zuboff contrasts the experience of two paper mills and two banks that computerised their work processes with the aim of increasing productivity. The term 'automating' was invoked by Zuboff to denote a pattern of implementation of information and communication technology that denies workers any opportunities to discuss the meaning of the symbolic data generated. In contrast, the term 'informating' denotes a pattern of deployment that presupposes workers have access to data and are required to interpret it.

These two different working environments generate meaning in different ways. Zuboff identifies three crucial differences. The first involves the relationship of symbols to a concrete world. As one of the workers interviewed explains:

'The computer makes your job easier...but it also makes things more complicated. You have to know how to read it and what it means. This is the biggest problem. What does that number actually mean? You have to know this if you want to really learn how to trust the technology'.

Zuboff (1988: 81)

This means that workers had to learn how to construct appropriate linkages between a symbol (e.g. a number) and the reality (e.g. an aspect of the production process) it relates to by attributing the link to a conceptual system or a set of reasons for the existence of the link.

The second type of complexity concerns the relationship between the data the computers provided and the new work processes. Instead of physically monitoring, and tacitly gauging, the performance of machines, workers are now expected to monitor the new work processes through the use of symbols; this made work more opaque with the result that decisions are more ambiguous. The third type of complexity relates to the change in the character of knowledge that is embodied in an electronic text compared with either the sentient knowledge of work processes or paper-based documentation.

'electronic texts do not have an author in the conventional sense. It may be produced from many individual acts of 'authorship' (for example, account officers enter their own data, manager send messages, customers provide data through automated teller machines), or it may result from impersonal and autonomous processes (for example, microprocessors register data from the production process, optical scanners read and input data)'.

Zuboff (1988: 180)

The implication of this 'textualisation of work' is conveyed by Zuboff (1988: 196) through the type of questions workers were forced to ask, for example, 'What is happening?' and 'What does this mean?[12], answering the type of questions that arise from working in a symbolic medium, as Zuboff (1988:95) and others (Weick

[12] Similar issues are raised in Hirschorn's (1987) study of a nuclear plant. He also reports how workers had to adjust to interpreting the symbolic data that flowed from the new IT systems that had been introduced.

1985:51-64), have acknowledged, raises issues of dialogue, visualisation, collaboration and risk-taking in the workplace. Whereas in the world of action-centred skill, the context of action sensitises workers as to what kind of details to look for and what kinds of data to expect, in a computer-mediated environment, a capacity for 'theoretical' or 'system thinking' becomes the principal source of understanding. As Zuboff concludes (1988: 95) accomplishing work:

'came to depend more upon thinking about and responding to an electronically presented symbolic medium than upon acting out know-how derived from sentient experience'.

The shift in the quality of knowledge required for working in these new computer-mediated environments is, however, rather more complex than it may first seem. It is not simply the replacement of one type of knowledge - tacit by another codified or explicit - knowledge. Zuboff (1988: 192) acknowledges that tacit knowledge continues to play a role in intellective skill development. One of the main reasons tacit knowledge is still important, according to Zuboff, is that our longterm memory is based on the apprehension of meaning rather than on responding to precise verbal or visual context. This means that when we work in informated environments our:

'intellective mastery will depend upon being able to develop a tacit knowledge that facilitates the recognition of decision alternatives and frees the mind for the kind of insight that could result in innovation and improvement. Such tacit recognition depends upon first being able to explicitly construct the significance of patterns and relationships in the data'.

Zuboff (1988: 192)

The development of meaning involves us grasping, what Brandom (2000: 158) refers to as, the 'representational' form of a text or utterance[13]. By this he means, that when we try to understand the thoughts, discourse or texts of others, we

[13] I have used Brandom's (2001) discussion of the difference between sentience and sapience to clarify the distinction Zuboff drew between action-centred and intellective skill. There is a clear parallel between her concepts and Brandom's discussion of different forms of knowing.

not only have to understand what they are saying but also what they are 'thinking or saying about it'. Stated another way, we have to be able to identify what follows from what has been said or observed.

These observations about the representational form of communication alerts us to the basis of meaning. It is only possible to understand what is someone is thinking about by being able to attribute the discourse or text to a wider frame of reference. Constructing the significance of patterns and relationships in data:

> 'cannot be achieved without a level of intellective skill development that allows the worker to solve the problem of reference, engage in reasoning that is both inductive and deductive and apply a conceptual framework to the information at hand. Meaning must be constructed explicitly in order for it to become implicit later'.
>
> Zuboff (1988: 192)

Thus, in contrast to Gibbons *et al.* and Nonaka and Takeuchi, Zuboff identifies the way in which different technological contexts enable us to develop different types of tacit knowledge. In traditional automated contexts, we developed a sentient form of tacit knowledge that supported individual action in the workplace, whereas in informated contexts we have to develop a radically different form of tacit knowledge. The step change between the development of the former compared with the latter is that it presupposes engaging in the 'social practice of reasoning' (Brandom 2000: 45). That is, we need to develop the ability to articulate to ourselves what is happening in the production process, to communicate that understanding to others, and to engage in collective discussions with others about what follows as a result of our deliberations.

Furthermore, she also makes an issue that they glossed over much clearer; namely that tacit and codified knowledge in modern work environments are intimately related to one another. This means that the capability to interpret, share and create knowledge is developed as we call upon both types of

knowledge when we form judgements about what is happening in the production process[14].

In doing so, Zuboff introduces a different dimension to the argument Gibbons *et al.* and Nonaka and Takeuchi made about the contribution of tacit knowledge in the economies of advanced industrial societies. She acknowledges that certain conditions have to be met if workers are to develop the tacit knowledge associated with intellective skill. The first condition is that workers require some from of 'training' to assist them to understand the data the technological system provides. In this sense, although she does not discuss the content of such training, Zuboff implicitly acknowledges the role of codified or theoretical knowledge as a cultural resource to help workers appreciate that they inhabit an already interpreted world. The second condition is that workers need to be provided with opportunities in the workplace to use information and communication technology in a number of ways. For example, they need to: (i) identify the significance of patterns and relationships that arise in data; (ii) construct meaning through dialogue and participation in workplace cultures; and (iii) apply conceptual frameworks to interpret the data at hand to clarify the nature of a problem and, then, inductively or deductively resolve problems. Thus, Zuboff reveals that working with information and communication technology requires new kinds of and new combinations of codified and tacit knowledge, and that these new forms of knowledge - in her terms intellective skills constitute the basis of knowledge creation in the workplace.

Conclusion

Chapter 3 has discussed the role of tacit knowledge in the economies of advanced

[14] The relationship between a particular type of tacit and theoretical knowledge – 'Techno-mathematical Literacy' - in informated environments is currently being investigated in a TLRP/ESRC Research Project 'Techno-mathematical Literacies in the Workplace'. Emerging evidence confirms Zuboff's thesis that new type of knowledge and skill that combine theoretical and tacit knowledge are formed in such environments, and that they present a major challenge (Kent *et al* forthcoming).

industrial societies. For Gibbons and colleagues and Nonaka and Takeuchi tacit knowledge is an integral component of the new modes of knowledge that they have identified. The chapter pointed out that there are a number issues as regards these claims about tacit knowledge that neither Gibbons and colleagues nor Nonaka and Takeuchi follow up. The first issue is that although both writers advocate a more pluralistic conception of knowledge to reflect the new modes of knowledge production emerging in the knowledge economy, they never explicate the epistemological implications of their assumptions. The second issue is that although they both extend Polyani's stance that tacit knowledge is an inherently personal form of knowledge by drawing attention to its social basis, they play down the multifaceted nature of tacit knowledge.

The workplace implications of these omissions were explored in the discussion of Zuboff. The chapter pointed out that Zuboff explicitly recognised the interdependency between theoretical and tacit knowledge and identified the way in which different conditions influence the development of different types of tacit knowledge. It noted, however, that although Zuboff engages these issues she was not concerned with the pedagogic implications of her own insights.

Finally, the writers discussed in this chapter, unlike Bell, Castells and Stehr, explicitly acknowledge that a knowledge economy is not just an economy that consists of more highly qualified people and more specialised products and services. Gibbons *et al.*, Nonaka and Takeuchi and Zuboff highlight that it is also an economy where scientific and tacit knowledge can only play the role claimed for them if workplace cultures facilitate professional collaboration. These observations offer substance to one of the claims that the thesis is advancing: that working in a knowledge economy or knowledge society does not simply involve the application of existing forms of knowledge or skill or pre-given rules. Instead, it presupposes that professionals can mediate between different forms of knowledge or competing sets of interests to respond reflexively to emerging economic, political and social pressures by establishing new knowledge criteria.

Chapter 4

The problem with the social and management theorists' accounts of the knowledge economy

Introduction

The intention of Chapters 2 and 3 was to offer an exposition of the views of a number of influential social and management theorists who have written about the role of knowledge in the economies of advanced industrial societies. The chapters identified and discussed a number of new concepts that Bell, Castells, Stehr, Gibbons *et al.* and Nonaka and Takeuchi had developed to explain the new type of organisations, economies and societies that they claimed were emerging. One common thread in their respective views was that knowledge has superseded land, labour and capital as the key factor in economic development in advanced economies. Despite arguing that knowledge constituted the critical economic resource, these writers drew very different conclusions about which type of knowledge was the most important for economic development: the social theorists emphasised the role of science, while the organisational theorists emphasised the role of tacit knowledge.

This chapter argues that the main reason that the aforementioned writers put forward such different explanations about the type of knowledge required in the knowledge economy is because they adopt fundamentally different epistemological standpoints from one another. The chapter substantiates this claim by locating their respective ideas about knowledge in relation to, what was referred to in Chapter 1 as, the 'two worlds' view of knowledge (Bakhurst 1991: 111). The current chapter starts by tracing the legacies of these two conceptions of knowledge in the work of Bell, Castells, Stehr, Gibbons *et al.* and Nonaka and Takeuchi. It then identifies how the same legacies predisposed

these writers to overlook certain issues about the role of knowledge in the economy that are central to their own theses.

The 'two worlds' view of knowledge

Background

The philosophical origins of the two worlds' dualism, as Bakhurst acknowledges (1991: 111), lies in the work of Descartes whose ideas about epistemology rested on the separation of the mind from the world. Following Descartes, Bakhurst defines the first world as the 'mental world', that is, the idea that individuals have direct access to this world through their thoughts, emotions, beliefs and intentions. He defines the second world as the 'material world', which consists of natural, physical and social structures that exist independently of thought[1].

This dualism has set the parameters of the debate in philosophy between empiricists and rationalists over the centuries about how to establish grounds for the objectivity of knowledge (Bakhurst 1991; Rorty 1979; Ward 1996). Moreover, the ideas originally expressed in empiricist and rationalist philosophies of knowledge are generally accepted as having provided the philosophical foundation for the concept of 'scientific realism'[3] (Shin 1999: 153; Toulmin 2001; Ward 1996: xvi). In simplified terms, scientific realists accept that science is capable of providing objective knowledge of the second of Bakhurst's two worlds. Equally, the critique of scientific realism initiated by Nitesche has been generally perceived as the inspiration for the development of 'postmodernism' (Kellner 1998; Lyotard 1984; Ward 1996), a multifaceted philosophical tradition that denies the possibility of grounding knowledge in some absolutistic or naturalistic view of the world. Postmodernists claim that all knowledge, regardless of its ontological status, has an emotional basis since it is

[1] The aim of this chapter is not to explore the details of the philosophical debate about scientific realism and postmodernism; its principle concern is to explore the implications of these philosophical traditions in the work of the social and organisational theorists discussed in the previous chapters.

[3] Many writers (Nowotny *et al.* 2002; Toulmin 2001; Ward 1996) have invoked the concept of scientific realism as a way of conceptualising the paradigmatic assumptions of the physical, natural and mathematical sciences. In this thesis, the discussion of the meaning of scientific realism draws primarily on the work of Ward (1997). In particular, it uses the first of the three 'divisions' he introduced to clarify the epistemic boundaries of scientific realism.

a product of interpretation. In this sense, it constitutes a form of knowledge that is based on the premises of the first of Bakhurst's two worlds.

The 'scientific realist' conception of knowledge

It is widely accepted that the concept of scientific realism is based on the following assumptions. The first is that an absolute reality exists beyond human consciousness that can be understood but not altered through human action. The second is that this reality can be apprehended and thus become more widely known and understood within society if the proper scientific method is used to identify it and make it intelligible. Furthermore, the 'scientific realist' conception of knowledge presupposes certain unique modes of constituting and organising reality and truth. These modes, according to Ward (1994: 1), are based on:

'the imposition of particular ontological, epistemological and methodological prescriptions, divisions and delimitations of reality and truth'.

Ward, following Foucault (1970), argues that these ways of organising and limiting reality and truth can be referred to as 'epistemes'. 'Epistemes' serve two main functions. They provide a set of relations that help to organise and classify knowledge. From this it follows, as Ward suggests, that 'epistemes' also impose moral and symbolic boundaries among individuals and social groups. These boundaries, in turn, create divisions between correct and incorrect ways of thinking and right and wrong procedures and practices.

The distinction between belief and truth, as Ward (1996: 2) points out, is one of the most important ways that science established its claim to produce objective knowledge of the world. Knowledge that is objective and hence true, is assumed to have certain defining characteristics. It is governed by cognitive norms that are based on a commitment to the empirical investigation of specific hypotheses and which are open to criticism, evaluation and reformulation by members of the scientific community. In contrast, other forms of knowledge about the natural and/or social world are derived from lay accounts of

phenomena and ad hoc techniques and are simply accepted at face value. Knowledge produced from within the scientific realist 'episteme' is, therefore, viewed as simply of a different type and a higher order than the knowledge produced from other ways of knowing (Ward 1996: 3). The application of scientific methodology was seen as a means of imposing 'discipline' on investigations and the investigation process (Toulmin 2001: 6)[2].

One consequence of this quest for discipline and procedure was the development of the scientific laboratory (Shapin 1994). The idea that there was an appropriate type of environment in which knowledge could be produced offered another way of demonstrating the difference between belief and knowledge (Ward 1996: 6). Scientific knowledge, according to this view, had extraordinary qualities because it was not only produced in a special place with special people and special equipment, but also because it was grounded in the principles of control and prediction. The scientific laboratory served a dual purpose an environment: where experiments were created and conducted and where they were collectively witnessed and experiments legitimated.

This development gave rise to the idea that the truth about the world could only be established by those members of the scientific community who practised what Shapin (1994: 193) refers to as 'epistemological decorum'. This 'decorum' required an appropriate style of conduct and access to special equipment that was only found in a laboratory. This was seen as a way of combating the possibility that the senses, on their own, could be misled by visual distortions or other sensory apparitions (Shapin and Schaffer 1985:37). The use of specialist equipment allowed scientists to organise and regiment their senses more effectively to examine and record natural events[3].

[2] Scientific realists contrasted their approach with the traditional forms of knowledge about the world that had relied on hearsay, personal accounts and introspectionism in order to account for what was happening in the world. The idea of an 'undisciplined' interrogation of events and phenomenon gradually became unacceptable within the burgeoning eighteenth century scientific community which felt it was possible to establish the true nature of objects (Shapin 1994).

[3] One of the most basic propositions of scientific realism, therefore, is that science, and only science, is capable of producing accurate representations of natural reality. The reason science has

The communities of philosophers and scientists that held that science produced 'true generalisations' about the world appreciated that their predictive capacity were likely to be established only when they were capable of being transmitted from one context to another (Toulmin 2001: 44-5). This aspiration was eventually realised by expressing scientific generalisations in mathematical terms. This provided science with a resource that other forms of knowledge lacked: hypotheses could be tested by other scientists and were only comprehensible to the specialist scientific communities who knew how manipulate the abstract symbols in which they were now expressed (Toulmin 2001: 44-5). Thus, it focused attention on what Toulin (2001: 6) refers to as the 'Euclidean assumptions' of science; namely, that all scientific theories had to have a logical structure and that changes in scientific theories were primarily a matter of the replacement of one logical structure by another one. These assumptions perpetuated the idea of the 'giveness' of the world in the scientific and lay communities and also that scientific development was an intrinsically rational process in the natural and physical sciences (Toulmin 2001: 6).

The 'postmodern' conception of knowledge

Over the last thirty years the idea that science is able to provide totally objective knowledge of the natural and social world has been consistently challenged in the social sciences. The main inspiration for the critique of science has come from the postmodern school of thought[4]. The founding father of postmodernism, as noted earlier, was Nietzsche. He viewed truth as having a rhetorical character and this led him led to conclude that all philosophical and scientific efforts at establishing transcendental, extra-human or objective knowledge were in vain (Ward 1996: 19). In response to logical positivism, which was the dominant scientific realist tradition of his time, and which sought

attained this preeminent position is simply because its predictive capacities spoke the 'language of nature'.(Rescheler1987: 4)

[4] Postmodernism is a profoundly complex and ambiguous theoretical tradition, which has been shaped by a diversity of intellectual and cultural currents. The label 'postmodernism' varies considerably according to context. Nevertheless, out of this maelstrom of divergent influences and tendencies a few widely shared principles have emerged. This thesis follows the approach adopted by writers such as Callincos (1989) and Ward (1996) and identifies only the broad tenets of postmodernism.

to ground knowledge in pure facts, Nietzsche (1968: 267) argued that: 'Facts are precisely what there is not, only interpretations'.

Nietzsche also argued that all attempts in science to ground knowledge in empirical methods were fundamentally misconceived. He contested the notion that the senses could be disciplined through practicing 'epistemological decorum' in such a way that accurate representations of reality were possible. The concepts of science and philosophy were, from Nietzsche's perspective, merely products of faith that allowed people to endure life. 'What made some knowledge claims appear truer that others was not their refined methodology or superior access to reality, but their political power' (Ward 1996:20).

Nietzsche's strategy for subverting the boundary conventions of 'scientific realism' has been adopted by many postmodernists in their continued attack on two of its most cherished components - the notions of foundational truth and the rational subject (Ward 1996: xviii). This leads to postmodernists' distrust in all attempts to ground: 'representation and knowledge in some philosophical or theoretical project, such as the Kantian subject, the perfection of language, or the empirical methods of science'.

A number of diverse schools of thought have been spawned by postmodernism, for example Baudrillard's 'hyper-reality' (1988), Derrida's 'deconstructionism' (1976) and Haraway's 'engendered knowledge' (1989). These schools have firmly rejected the idea that science is capable of providing any 'foundational' knowledge and, moreover, have argued that there is no definitive basis for establishing the truth about particular sets of circumstances or events in the world. Postmodernism's anti-foundationalist view of knowledge is neatly summed up by Lyotard. Building on Nietzsche's critique of science as merely a product of faith that allowed people to endure life, Lyotard maintained that it continues to be accepted as article of faith in modernity. As a result, the concept of foundational knowledge had been used to justify the modernist claims about the scientific inevitability of progress towards a more perfect society. From this position, Lyotard evolved an argument for an anti

foundationalism based on an 'incredulity towards metanarratives', a concept that has become one of the central tenets of postmodernism (Jameson 1984).

Lyotard (1984: xxii) also claimed that the various discourses that support modernity and which emphasise spiritual and material progress through the progressive application of science within everyday life have, in light of the developments of the twentieth century, lost their legitimacy and credibility. Moreover, he argued that all discourse and truth claims are based on radically different language games, each with their own unique linguistic rules, moves and structures. In this sense, they are 'heteromorphous' and, by definition, incapable of grasping and reporting reality. Based on this claim, Lyotard proposed that the main issue that should concern philosophy was the 'performativity' (1984: 46-7) of knowledge: that is, its contribution to changing the world rather than its ability to provide knowledge about the world.

The anti-foundational stance has resulted in postmodernists concluding that the possibility of an accurate account of phenomenon being established and brought to light is nothing more than a figment of the imagination of scientific realists. For the postmodernist, the descriptive and explanatory language of science is fraught with problems of interpretation, translation, reception and referentiality and, as a consequence, scientific representations can never constitute anything more than contingent and context-dependent approximations of reality. In contrast to scientific realism, postmodernism 'levels or symmetricalises' all forms of discourse and truth claims: a move that requires that all knowledge forms be treated as equally valid (Ward 1996: 38). Stated another way, postmodernism introduces a pluralist conception of knowledge which stresses the similarities that exist between the theoretical knowledge produced in the natural and social sciences and the 'everyday' knowledge produced locally in different 'community' settings.

The contention of the thesis is that the tenets of scientific realism and postmodernism underpin the social and management theorists' ideas about the new role of knowledge in the economies of advanced industrial societies. For

this reason, the next two sections trace the continuing legacy and implications of these philosophical traditions in the work of Bell, Castells, Stehr, Gibbons and colleagues and of Nonaka and Takeuchi.

Social theory, scientific realism and the knowledge economy

The legacy of scientific realism in the work of Bell, Castells and Stehr

It has been widely accepted by a number of writers (Muller 2001; Schiller 1997; Stehr 1994) that Bell's views about the primacy of science and theoretical knowledge (he uses the terms interchangeably) rest on an unquestioned assumption about the nature of scientific knowledge and scientific inquiry. These writers have maintained that Bell accepts as unproblematic the premises that had been associated with science and scientific activity since the nineteenth century, namely that the pursuit of knowledge is rational and legitimate and governed solely by its own rules and procedure.

The absence of any questioning of the status of scientific knowledge or about its impact on society and within the economy means Bell embraced the tacit consensus that had existed within the scientific community about the nature of scientific knowledge and scientific discovery. The foundation of this consensus rested on the 'linear discovery model' of science' (Ziman 1984: 7), which led Bell (1974: 31) to view knowledge as 'linear, cumulative, and quantitative for there are specific rules for the process of growth and differentiation'.

In other words, he accepted that the form of modern science was organic and knowledge-acquiring and that once new theories and concepts had been discovered, it was a fairly straightforward matter to apply scientific knowledge within society. Bell presents the scientific production of knowledge as though it is a series of ideal outcomes, located in universities and research institutes where scientists work and whose translation into different and varied technological forms is relatively unproblematic. For Bell, the power and legitimacy that demarcate theoretical knowledge are not affected by time and

place, not least because given that theoretical knowledge is independent of any contingent conditions, it can be 'translated into many different and varied circumstances' (Stehr 1994: 67). Consequently, Bell endorsed that knowledge constituted the 'axial principle' of economic development because he simply assumed the givenness of reality and the legitimacy of scientific knowledge.

At first sight, it is more difficult to identify the legacy of scientific realism in the work of Castells because, unlike Bell, he does not engage in any epistemological discussion about the status of knowledge. One of the main reasons why Castells only touches tangentially upon epistemological issues is because he felt that he had 'no compelling reason' to improve on Bell's own definition of knowledge. Furthermore, Castells even went so far as to consolidate his debt to Bell (as noted in Chapter 2) by adopting a definition of 'information' that was also, more or less, congruent with Bell's use of the term. The net effect of these actions is that Castells ends up, by default, sharing a similar philosophical position with Bell about the character of knowledge, since he too conceptualises knowledge in accordance with a fairly strong version of 'scientific realism', albeit implicitly (Muller 2001: 276-277). One overt manifestation of this implicit adoption of scientific realism is that Castells, like Bell, treats knowledge and information as though they are fairly malleable, serve fairly utilitarian functions in society, and that their meaning is fairly transparent (Muller 2001: 287).

Of the three theorists discussed, Stehr's attachment to the social action tradition led him to acknowledge that the new role of knowledge in advanced industrial societies raises epistemological issues. Nevertheless, Stehr still perpetuates a number of scientific realist assumptions about knowledge that also surface in the writings of Bell and Castells. For example, Stehr places an unswerving faith in the inherent progressivism of science by referring to it as an 'immediate productive force' and asserting, with confidence, that science can always be harnessed to serve society's needs. Furthermore, he accepts that science constitutes a model of rational calculation that can be employed to illuminate social and cultural issue.

The implication of scientific realism in the work of Bell, Castells and Stehr

Sociologists such as Bell, Castells, Stehr and others who have taken an epochal attitude to their times have, as Osborne (1998: 44) observed, been particularly preoccupied with the idea of the conquest of life by science. This emphasis upon the intrinsic rationality of scientific research and development means that Bell, Castells and Stehr disregard a number of issues about the character of knowledge and the application of knowledge, which are central to their own theses as well as to the argument of this thesis.

The first issue is that Bell, Castells and Stehr's attachment to the power of science means that they accept scientific knowledge as a 'given' and not the outcome, at any time, of external influences or debates within disciplines. The implication of this manifests itself in the work of each writer in different ways.

By conceiving of post-industrial societies primarily in economic terms as defined by, and measured in, the increased knowledge component of a nation's Gross National Product, Bell renders knowledge as an independent variable that could be employed to explain economic, social and political change. One consequence of this assumption is that in his approach to the process of modernisation within industrial societies, Bell, together with Castells, Stehr and other social theorists, overlook, as Knorr Cetina (1999: 6), points out, that knowledge is 'a production context in its own right'. She suggests that to understand the transformative effects of theoretical knowledge within society it is also vital to study the structures and processes, which enable knowledge to be produced in the first instance. This is, in part, because it is these processes, experiences and relationships that enable knowledge to unfold in this particular way. Equally, by conceiving of information societies primarily in technological terms Castells focuses on the contribution of knowledge and information to productivity, or as he puts it, 'knowledge acting upon knowledge'. The main reason this instrumental conception of knowledge surfaces is the pervasive influence of information systems theory within Castells work (Webster 1997a 120). This leads him to follow the current tendency in artificial intelligence and information systems theory to conflate knowledge and information and to

imply that computers contain or even produce knowledge. In doing so, Castells overlooks the fact that the concept of knowledge presupposes the idea of a 'knower'. It is this element of personal attachment that differentiates knowledge from information as well as providing knowledge with the potential to be used to transform human, as well as economic, development (Seely Brown and Duguid 2000: 119-120). This suggests that the process of knowledge acting on knowledge and the communication and assimilation of knowledge, is much more complex than Castells indicates because information has to be located within some type of interpretive framework before its value can be assessed.

In some ways it is surprising that Stehr (2001: 164) clings to the giveness of knowledge, since he acknowledges that a number of writers (Funtowicz and Ravetz 1993; Gibbons *et al.* 1994) have argued that the scientific realist model of science has 'undergone significant changes in recent years'. Stehr, however, expresses his indifference towards these developments, preferring to argue that their implications for science are 'somewhat elusive', rather than to consider their potential implications for the character of knowledge societies/economies.

The second issue is that Bell and Castells treat theoretical knowledge as though it is a discernible cultural object that can be acquired easily and applied to problems to find solutions. By adhering to this strong version of what Muller (2001:277) has referred to as a 'political economy' conception of knowledge, they both assume that knowledge is a commodity that can be manipulated. As a consequence, Bell proceeds as though knowledge possesses intrinsic qualities and plays down the contingent aspect of knowledge. Thus he glosses over the influence of social and cultural context on the communication and application of knowledge and the extent to which knowledge only gains its power through the way that different social groups actually use it (Schiller 1997).

A slightly different conception of the commodification of knowledge manifests itself in Castells' writings. He treats knowledge and information as though they are both malleable resources and assumes it is a fairly straightforward matter

to transform the 'information' contained in documents and texts into usable knowledge (Webster 1997a 120). The reason why the complexity of human cognition and communication in the translation of information is rarely, if ever, acknowledged is in part because Castells is inclined to rely on what Reddy (1979) has dubbed, a 'conduit metaphor'. In other words, Castells simply assumes that the work that has to be undertaken to transfer data from a computer to the human mind and from one mind to another is relatively unproblematical. The process of transfer is simply a technical matter of manipulating data encoded in symbolic form. Although he is more sensitive than Castells to the influence of context on the transmission and application of knowledge, Stehr also adopts implicitly a 'conduit' conception of communication. Thus he concludes that the guidance and advice provided by knowledge workers can be acted on directly and is therefore a productive force within society. It is as though the contested basis of science can be eviscerated through communication.

One of the consequences of accepting the intrinsic rationality of scientific knowledge is that Bell, Castells and Stehr all assume that science, by itself, is the 'engine' that impels technological and social change. In doing so, they unconsciously adopt that which Dennett (1987) has called a 'design strategy' notion of social transformation. This conception is based on the assumption that it is the design of the technological features of any system that is responsible for producing a specific set of outcomes, for improving and securing the results of that system and which is primarily responsible for generating new information, products and services. Its influence on Bell, Castells and Stehr's thinking lead them to assume that the process of modernisation can be gauged by looking at the transformative impact of science on societies and economies, simply because scientific research has been successfully applied within a particular economic or organisational system (Knorr Cetina 1997: 8).

The absorption of the 'design strategy' model of transformation into Bell, Castells and Stehr's ideas about the role of knowledge in the economy can be evidenced in the following ways. Each writer points to the structural features of

those economies, the final output of knowledge inputs (i.e. new products and services) within the economy, and the transformative effects of scientific knowledge on different aspects of social and cultural life, on personal life and identity, industrial organisation and market expansion, etc.

Thus, in common with many other 'modernisation' theorists, such as Beck (1992) Giddens (1990) and Lash and Urry (1994), Bell, Castells and Stehr concentrate primarily on the technological or interpretative output of knowledge. Thus, they tend to assume that the definition of a 'knowledge society', 'knowledge economy' or 'knowledge work' hinges on, in Castells' case, claims about the emergence of a new technological paradigm and, in Bell's and Stehr's cases, the quantitative evidence about the increase in knowledge-based products and services.

One consequence of this preoccupation with the 'design stance' and the expanding presence of expert systems and knowledge processes in contemporary societies is that Bell, Castells and Stehr do not pay attention to the relation between epistemic activity and epistemic cultures to the development of science (Knorr Cetina 1997; 1999). Yet, it is this activities and cultures that makes knowledge economies/societies distinctively different from previous types of economies/societies. To understand why this is the case, it is necessary to analyse the relationship between the type of culture that fosters the production of knowledge in different settings.

Knowledge, culture and the economy

Introduction

The significance of the relationship between culture and knowledge production, as Knorr Cetina (1999: 8) observes, has only recently been appreciated in the debate about the knowledge economy. This relationship has been a

longstanding concern in science studies[5] and the relevance of work in this field to the debate about the knowledge economy/society is gradually being accepted in the social sciences (Latour (2000: 108). This is partly because some researchers in science studies, for example, Knorr Cetina (1997), have identified an aspect of the knowledge economy/society debate that hitherto was neglected by many social theorists. In particular, Knorr Cetina, has drawn attention to the contribution that knowledge (or in her terms *epistemic*) cultures make to knowledge societies/economies. For this reason, the next section of the chapter uses her work to go beyond both Bell, Castells and Stehr and Gibbons *et al.* and Nonaka and Takeuchi's ideas about the role of knowledge in the economies of advanced industrial societies.

The relationship between 'epistemic' cultures and economic activity

Knorr Cetina has pointed to one of the limitations of concentrating primarily on quantitative evidence about the increase in knowledge-based products and services and expert systems as the primary indicators for understanding the emergence of knowledge economies/societies. She argued that:

'The expanding role of expert systems does not only result in the massive presence of technological and informational products of knowledge processes. It means that knowledge [that is *epistemic* cultures] have spilled and woven their tissue into society'.

Knorr Cetina (1997: 8)

The concept of an 'epistemic culture' refers to:

'Those amalgams of arrangements and mechanism - bonded through affinity, necessity, and historical co-incidence - which, in a given field, make up *how we know what we know*. Epistemic cultures are cultures that create and warrant knowledge, and the premier knowledge institution throughout the world is, still, science'.

(ibid)

[5] It is widely accepted that there are many affinities between postmodernism and science studies, which is normally deemed to be located within a 'constructionist' epistemological tradition (Ward 1996;). Postmodernism and science studies share a common goal of putting an end to realist epistemology and corresponding theories of truth; they also reject the traditional philosophical quest to find an epistemological privileged position from which to mirror reality. I have chosen to concentrate on postmodernism in my discussion about the two-worlds of knowledge because it has been a more influential tradition in the social sciences.

She continues this theme about the relationship between culture and knowledge production by arguing that:

'A knowledge society (knowledge economy) is not simply a society [economy] of more experts, more technological gadgets, more specialist interpretations[6] (it is also) a society [and economy] permeated with knowledge cultures, the whole set of structures and mechanisms that serve knowledge and unfold with its articulation'

(ibid)

Knorr Cetina (1999: 8) made the crucial point that presenting the case for the knowledge economy solely in terms of the increase in expert systems or knowledge-intensive products and services overlooks the crucial role that *epistemic cultures* make to the production and application of science. One of the reasons for taking account of how knowledge is produced, shared and applied in specific settings is to highlight the transformative effect that knowledge might have in the economy. Knorr Cetina employs two different, but related, approaches to illustrate this issue[7].

The first approach is to explore the role of such cultures in science by comparing how two scientific fields - high-energy physics (HEP) and molecular biology - organise their strategies for acquiring knowledge. One of Knorr Cetina's most revealing insights is the fundamentally different forms epistemic cultures can take. She argues that the main challenge for physicists working in HEP laboratories is to break down, intentionally, the sense of epistemological certainty that often pervades laboratories in order to create new knowledge. This is primarily because physicists engage for long periods of time in a form of

[6] There is a parallel between Knorr Cetina's concern with establishing a broader definition of the role of knowledge in 'knowledge societies' and the concern of this thesis to establish a broader definition of the role of knowledge in the economy. Both are interested in identifying, albeit in different ways, the relationship between knowledge cultures and knowledge-producing activities. For this reason, this thesis has highlighted the parallels between the respective arguments by inserting the references to the knowledge economy into her original text.

[7] The origins of Knorr Cetina's theoretical approach to the study of science lie in ethnomethodology and the sociology of culture (1999: 10). These intellectual influences lead her to focus on how the production of scientific knowledge in 'epistemic cultures' relies on new social relations that are based on what she refers to as 'object-relations' (Knorr Cetina 1997).

self-reflection and self-analysis of the way they study objects and natural and quasi-natural objects are admitted to experiments only rarely. Physicists deal with highly interpreted entities and are, therefore, immersed in a 'sea of signs' (Pinch 2000). Knorr Cetina illustrates how physicists, working in research teams which are often distributed across different sites, use their interpretative practices which are guided by theoretical knowledge, models, simulations and statistical procedures, to produce, what she refers to as 'negative knowledge' (Knorr Cetina 1999: 73). In other words, by identifying the multifarious ways things can go wrong, HEP manages to produce new knowledge.

In contrast, molecular biology flourishes in more conventional laboratory conditions because experiments in molecular biology are conducted in fairly traditional environments, where researchers work in accordance with a set of protocols issued by the head of the laboratory. The primary aim is to maximise interaction with natural objects and to generate the acquisition of experimental knowledge about molecular structures. Molecular biologists achieve this by responding to a problem, such as a malfunctioning reaction, in a different ways to the physicists. The former are actively encouraged to compete with one another by trying different variations of their laboratory procedures with the expectation that it will result in the discovery of new evidence[6].

The analysis of these two different epistemic cultures reveals the diverse aggregation of patterns and dynamics that are displayed in expert scientific practice and how they differ from setting to setting. Specifically, they draw attention to the way that epistemic cultures nurture different approaches to the manipulation, deciphering, inspection, tinkering with, and interpretation of the outcomes of the research. Hence, Knorr Cetina's analysis implies that insofar as it is the epistemic activities associated with different epistemic cultures that

[6] These different types of epistemic cultures are also characterised by quite different management cultures. HEP involves the introduction of new types of social structures, which Knorr Cetina (1999: 159) refers to as 'post-traditional communitarian structures'. This type of social structure is based on a form of 'management by consent'. It involves the creation of spatial arrangements and the setting up of special discourses and meetings to create a sort of 'distributed cognition' (1999: 242) through which work becomes co-ordinated, self-organisation is made possible and knowledge is produced. In contrast, molecular biology laboratories are characterised by a traditional organisational hierarchy,

allows science to play the role in the knowledge economy that Bell, Castels and Stehr claim, we need to consider whether such cultures play a comparable role elsewhere in the economy.

She pursues this theme by drawing a parallel between the type of environment and culture in which most experimental sciences thrive with the type of environment and culture other knowledge-generating activities require. One of the features of knowledge societies is that:

> 'some of the structural forms one finds in epistemic cultures will become or have already become of wider relevance in a knowledge society [knowledge economy]. For example, the laboratory is such a structural form, and practices of management by consent are associated with it. Other structural forms are, on a micro-level, object-centred relationships...which I claim charactertise knowledge societies more than person centred relationships, since they also characterise expert settings'.
>
> Knorr Cetina (1999: 242)

She turns to Rheinberger's (1992: 310) notion of 'experimental systems' to identify the way in which some of the features of epistemic cultures are relevant to other fields of professional expertise. The defining characteristics of experimental systems, according to Rheinberger, are the 'scientific objects of investigation', for example, HEPs sign-mediated data that are at the centre of the research process (Knorr Cetina 1997: 10); and the 'technological objects' such as computers that scientists use in laboratories to create new knowledge. The outcome of the research process, in Rheinberger's (1992: 310) terms the 'epistemic object', is defined through the interplay between the question generating aspect of the research process and the use of technological objects to stabilise that process and to provide answers to the research questions.

This idea of an epistemic object can, according to Knorr Cetina (1997: 4-5), be extended to apply to all fields of expertise. She argues that experts in fields other than science who formulate questions and use computers and computer

dominated by a de facto head, and facilitate the production of new knowledge through adhering to well-established working practices.

programmes realise the purpose of the epistemic activity in which they are engaged. Thus, it follows for Knorr Cetina (2001) that forms of work other than science also generate knowledge providing they are also characterised by their own epistemic cultures, epistemic activities and epistemic objects.

One way that Knorr Cetina explains the parallel between the operation of global financial markets is to argue that 'trading' has developed its own epistemic culture and its own distinctive form of epistemic activity. The first aspect of this culture, according to Bruegger and Knorr Cetina (2000: 5), is that traders are continually having to:

'define the market not only in the sense of trying to read and understand it, but also in the sense of 'making' or articulating it, by testing it, moving it, and manipulating it'.

This means that traders are constantly engaged in a struggle to understand the operation of financial markets through a process of collecting and discounting relevant information. Thus, from Knorr Cetina's perspective, financial markets (and by extension other forms of work based on the collection and discounting of information) are knowledge objects for those who participate in them. They display themselves as complex entities that force traders to continually question their own interpretation about what is happening. A second aspect of the culture is that traders are continually involved in a determined effort to try to find information about the likely performance of the financial market.

One of the distinctive types of epistemic activity that characterises their work, according to Knorr Cetina (2001), is 'reciprocal gift exchange'. Traders continually offer information to clients or potential clients without requesting payment in order to develop relationships and lay the groundwork for future trading. A further feature of this culture is that social practices have to be established to ensure that the 'embedded' information offered by traders, that is, tied to the social organisation of the economic system, can be 'disembedded' and made intelligible to potential clients.

It can be argued that the concept of epistemic activity that emerges from Knorr Cetina's analysis of financial traders presupposes a form of inter-professional collaboration. The hallmarks of this collaboration are firstly the establishment of rules of trust, exclusivity and loyalty that offer structure to markets and influence exchange outcomes have to be established so that information can flow through interpersonal and organisational ties. Secondly, traders have to learn how bridge different epistemological preconceptions so that they and their clients understand what follows from adopting a certain position in the market. Bridging different epistemological traditions is an even more complex matter when working in multi-disciplinary teams (Hall *et al.* (2002). It involves finding ways to develop hybrid and selective forms of perception and action that take account of different work practices and local accountabilities. This issue is returned to in Chapter 10.

Management theory, postmodernism and the knowledge economy

The legacy of postmodernism in the work of Gibbons *et al.* and Nonaka and Takeuchi

It is possible to detect a postmodern influence in Gibbons *et al's* work from the polemic tone that permeates their observation that the emergence of Mode 2 knowledge fundamentally calls into question the whole edifice of scientific realism (Gibbons *et al.* 1994). They justify their argument that the foundational principles of science are withering away by claiming that Mode 2 knowledge, unlike science, is:

> 'Incomplete - no longer in the conventional sense that it will eventually be superseded by superior science (for Popperians) or by a new scientific paradigm (for Kuhnians), but also in the sense that it is sharply contested (and no longer within the controlled environment of scientific peers but in the wider *agora*); and second, this shift involves re-negotiating and re-interpreting these boundaries'.
>
> (Nowotony *et al.* (2001: 199)

Moreover, in making their case, Gibbons and colleagues imply that Mode 2 knowledge will, ultimately, 'replace' (Muller 2000: 46-8)[8] science as the dominant mode of knowledge production. They base this claim on the following arguments. The first is that the emergence of a new market-based economic rationality is now acting as a 'principal filter' to ensure that public and private sources of funding for research are equally concerned with identifying tangible economic benefits. This concern with the performativity of research results in constant pressure from funders to involve a wide range of stakeholder communities in the production and verification of Mode 2 knowledge. For Gibbons *et al.*, this continued weakening of the insulation of science from society constitutes incontrovertible evidence of a trend that they contend will perpetuate a demand for an extension of Mode 2 knowledge. Their second argument is that the increased concern to develop knowledge in its context of application is making the tacit knowledge held by members of the different scientific and workplace communities the bedrock of Mode 2. This consolidates a much more pluralistic conception of knowledge and calls for new standards against which knowledge can be assessed. For Gibbons and his colleagues, one of the consequences is the growth of inter-disciplinary research teams, which use tacit knowledge both to identify the problems that require solutions and also to ascertain how far the resulting Mode 2 knowledge constitutes a solution to those problems[9].

At first sight it is more difficult to trace a postmodern influence on the work of Nonaka and Takeuchi. Not only do they, as Chapter 3 noted, view their theory of 'knowledge conversion' as an attempt to overcome the separation

[8] Muller has, however, detected some ambivalence in the collective position presented in their work about the implications of Mode 2 knowledge. He argues that, from time to time, Gibbons *et al* appear to suggest that Mode 2 knowledge production will, ultimately, *replace* mode 1 knowledge completely. On other occasions they imply it may only *supplement* Mode 1 (2000: 48). This thesis chooses to emphasise the idea of 'replacement' because it is this perspective that informs Gibbons and colleagues' subsequent work on the implications of Mode 2 more widely within societies (Nowotony *et al.* 2001).

[9] In a later work, Gibbons and some of his original colleagues acknowledge that the emergence of Mode 2 introduces a more overt sociological dimension into the debate about knowledge economies than they had initially appreciated. They argue that the development of more open systems of knowledge production heralds a new type of economy and society, which they refer to as 'Mode 2 society' (Nowotony *et al.* 2001).

of mind and world (Nonaka and Takeuchi 1995: 61), they also eschew any explicit references to post modernism in their writings. For this reason, they, and other scholars familiar with their work, may be surprised, even startled, to discover that their work is interpreted as evincing a postmodern sensibility and as remaining trapped in the dualism. Nevertheless, there are some affinities between the epistemological position outlined by Nonaka and Takeuchi and that held by postmodernists.

There are nevertheless postmodern inflections in Nonaka and Takeuchi's work. One of the clearest examples is their disavowal of the scientific realist assumption that scientific methods are the main means whereby new knowledge is produced. In contrast, they maintain, following Polyani that the reservoir of 'subjective, bodily, and tacit aspects of knowledge' individual's hold is an inescapable element in the production of knowledge (Nonaka and Takeuchi 1995: 60). They state that:

'To know something is to create its image or pattern by tacitly integrating particulars. In order to understand the pattern as a meaningful whole, it is necessary to integrate one's body with the particulars'.

According to Nonaka and Takeuchi, new knowledge is produced not by disciplining the senses through practicing epistemological decorum but by communicating bodily-acquired tacit understandings through the production of 'mental models'. This emphasis on the primacy of the body in shaping emotional responses to experience of the world, leads Nonaka and Takeuchi to argue that people form tacit pictures or patterns that capture and represent the significance of their experiences of the workplace. Nonaka and Takeuchi emphasise the role of 'metaphors' in assisting the verbalisation of tacit understandings and in the formation of new concepts, for example, metaphorical representations of new production processes. Hence, Nonaka and Takeuchi, along with many postmodernists, assume that people's awareness of the world, including their indirect awareness, can be equated with representations (i.e. metaphors) of their experience. Thus, we can, in the

case of postmodernists, transform the world, and in Nonaka and Takeuchi's case create products and services through sharing with others the mental representations they produce as a result of personal experience of the world.

A further example of the postmodernist inflection of Nonaka and Takeuchi's ideas about knowledge creation is that they accept that the only criteria to judge the knowledge that accrues from the conversion of tacit into explicit knowledge is the extent to which it resolve the problem in hand. Thus, although they do not invoke the language of performativity, Nonaka and Takeuchi follow the postmodernists in maintaining that there are no objective standards for assessing competing knowledge claims.

The implications of postmodernism in the work of Gibbons *et al.* and Nonaka and Takeuchi

Postmodernism was characterised, as we saw earlier in the chapter, by a number of key tenets, for example, to maintain the idea that truth and reality are outmoded concepts, to symmetricalise all forms of knowledge and to only be concerned with the performativity of knowledge. It can be argued that, in their attempt to articulate what they perceive to be new and distinctive about the role of tacit knowledge in the economies of advanced industrial societies, Gibbons *et al.* and Nonaka and Takeuchi symmetricalise tacit and theoretical knowledge. Thus, they stress that tacit knowledge is as important as theoretical knowledge in the knowledge economy, this position has theoretical consequences for their respective theses about the production of new knowledge as well as a strong bearing on the argument of this thesis.

Gibbons *et al.* and Nonaka and Takeuchi do not explicitly adopt the language of postmodernism to substantiate their case about the importance of tacit over theoretical knowledge. In contrast, they maintain that the philosophical basis for privileging tacit knowledge over the propositional knowledge associated with science lies in the work of Polanyi. Although this claim is asserted but not really explored in any great detail in Gibbons and colleagues' book, Nonaka and Takeuchi offer a fuller justification of Polanyi's influence on their thinking

about the role of tacit knowledge in the knowledge economy. It is nevertheless my contention that by symmetricalising tacit and theoretical knowledge both writers misinterpret Polanyi's position on this matter and miss the value of his insights about tacit knowledge for their argument about its role in the knowledge economy.

When Polanyi originally invoked the notion of tacit knowledge, his concern was to present the case for a holistic understanding of scientific knowledge, rather than to introduce another category of knowledge (Thorpe 1999). Put simply, his argument was that the way in which scientists used and developed knowledge could not be explained only through reference to its propositional basis. Most discussions of Polanyi's work within management theory and other related fields (i.e. organisational theory) tend to end with his famous phrase 'we know more than we can tell' (Polanyi 1966: 4). For Polanyi (1966: 4), this was paradoxically only the beginning, as he observed 'I shall consider human knowledge by starting from [this] fact'.

This is partly because Polanyi wanted to address the relationship between the articulatable and inarticulatable elements of knowledge. He concluded that tacit knowledge is not an informal, inchoate or obscure form of knowledge, whose nature calls for it to be made explicit in order to be understood or useful in practice; his formulation was much more subtle (Thorpe 1999: 24). Polanyi wanted to acknowledge that science, along with all forms of knowledge, always have a tacit dimension. He further argued that if

> 'the declared aim of modern science is to establish a strictly detached, objective knowledge.... [and if] tacit thought forms an indispensable part of all human knowledge, then the ideal of eliminating all personal elements of knowledge would, in effect, aim oat the destruction of knowledge.
>
> Polanyi (1966: 20)

Thus, the idea of skilful performance in the world of science, just as in art or any other field, for Polanyi, is not achieved solely through following explicitly formulated rules based on propositional knowledge It also requires that a

number of other factors are taken into account in practice which are left out in the formulation of [explicit] rules' (Polanyi 1958: 49).

This means that Polanyi is not arguing for two types of knowledge, he is, as Seely Brown and Duguid (2001: 203-4) have observed, merely maintaining that scientific knowledge has two interdependent dimensions. By overlooking this aspect of Polanyi's argument, Gibbons *et al.* and Nonaka and Takeuchi sever the link between theoretical and tacit knowledge. Thus, the former gloss over the relationship between the disciplinary and tacit knowledge held by transdisciplinary research teams and their respective contribution to the production of Mode 2, while the latter imply that new forms of knowledge they identify have no relation to existing modes of theoretical knowledge. Thus, they lose sight of Polanyi's original position about the interdependence between tacit and theoretical knowledge and end up symmetricalising these forms of knowledge. In the process, they fail to detect that the knowledge economy is making this relationship much more explicit than in the past.

The second issue is that Nonaka and Takeuchi's focus on the primacy of the body in the integration of particulars to the whole, mirrors Polanyi's argument about 'indwelling'. Polanyi uses this term to convey the idea that the immersion or enculturation of scientists in a set of theoretical presuppositions and physical skills related to their disciplinary field, gradually leads them to 'interiorise' the relation between the practical and the theoretical (Thorpe (1999: 25-5). Thus, Polayi (1966: 25) conceives indwelling as entailing a tacit transmission of culture, which both transcends and consumes the individual. For him, meaning is established through the way practical actions impact on the body or the senses. (Polanyi 1966: 13).

There are a number of problems associated with this position, however, which raise issues about the robustness of Nonaka and Takeuchi's descriptions of the process of knowledge conversion. First, Polyani's position on indwelling rests on his use of Gestalt psychology. The conventional Gestalt standpoint assumes that knowledge is acquired through perception and that meaning arises

through immersion in practical activity "through the spontaneous equilibration of its particulars impressed on the retina of the brain'.

Polanyi (1966:6) developed a counter argument. He argued that perception 'is the outcome of an active shaping of experience in the pursuit of knowledge'. One of the unforeseen consequences of recasting the structure of Gestalt into the logic of tacit thought, is that Polanyi remains wedded to what Brandom (2000: 4) has referred to as, the 'representational paradigm'[7]. This, according to Brandom, portrays the relationship of mind to world as one in which the knowledge gained through sense impressions is made meaningful by the constructions that are put on those impressions. However, Polanyi leaves the representational paradigm untouched in his new formulation. In effect, he merely replaces one type of sense impression that the mind has to deal with in order to make the world meaningful (i.e. images impressed on the retina), with another (i.e. bodily impact of practical actions).

The legacy of the representational paradigm in Polanyi's work leads Nonaka and Takeuchi to conceive of the knowledge conversion process simply as one of sharing cognitive representations about production processes. However, as Brandom (2000: 47) argues, responding to different forms of sensory impression does not consist merely of making a mental representation and then sharing that construction. It is a process of 'inferring'[8] rather than 'representing' because even non-inferential reports must be inferentially articulated.

For Brandom, the responses that people make involve an understanding of the significance of an action and this is only possible if they understand the concept(s) that shape and determine the character of that action. Such concepts

[7] Brandom's (2000) critique of the representational paradigm was formulated as part of his intervention in the philosophy of mind in order to highlight the importance of an 'inferentialist' account of knowledge and what it means to know something. Its wider relevance for interpreting the legacy of 'representationalism' in the human and social sciences has been demonstrated by Derry (2003).

[8] It is customary in philosophy to recognise three modes of inference: deductive, inductive and abductive (OUP 1995), Brandom use of the term inference reflects his particular interpretation of

are themselves underpinned by a system of judgements that help individuals give them coherence (Derry 2003:51). This implies that to stablise the meaning of the diverse representations that individuals hold, an additional dimension is necessary, namely, as Brandom observes (2000: 4) the ability to approach:

'the contents of conceptually *explicit* propositions or principles from the direction of what is *implicit* in the practices of using expression and acquiring or deploying beliefs.'.

The stabilisation of meaning presupposes, in other words, an individual's identification and understanding of the propositions that underpin and inform the tacit knowledge of others in order to grasp why such a thing is so and what follows from knowing that this is the case. It also involves the identification of the conditions that enable individuals to act on the inferences they make, given that understandings are shaped as much by epistemological presuppositions as by perceptions. The issue of inference is never addressed by Polyani because he maintains that an individual gradually comes to terms with the meaning of his actions through the process of indwelling.

One of the consequences of Nonaka and Takeuchi adopting, implicitly, Polanyi's position on indwelling is that they end up, in contra-distinction to Zuboff, affirming the sentient basis of knowing in technological environments whilst severing the tacit dimension of knowing from its propositional basis. Although it is widely accepted that indwelling is an important part of the enculturation process (Collins 1974), knowing why such a thing is so and what follows from knowing this cannot be reduced to sentient intelligence. For this to happen, as the discussion of Zuboff's work in Chapter 3 made clear, in order to interpret textual data about the performance of technological systems and also to respond to the interpretations of others, it is necessary to know what course of action will follow on from knowing that something is the case. This implies that not all tacit understandings are purely implicit and sentient. In contrast, many of them are social and cultural and involve using language to articulate the reasons that lie behind and inform understandings and actions.

inference as meaning 'to understand what follows from maintaining a position or taking a specific

This conception of tacit knowledge suggests that the challenge in the knowledge economy is not, as Nonaka and Takuchi maintain, to share mental representations, rather it is, as Cook and Seely Brown (2000: 394) claim, to 'bridge different epistemological traditions and preconceptions'.

The third issue follows from the second. In implicitly following Polanyi's presumption that the form of human activity that occurs through the process of indwelling yields a form of knowledge that remains personal and private, Nonaka and Takeuchi (and for that matter Gibbons *et al.*) give the impression that tacit knowledge is a single type of knowledge. Thus Nonaka and Takeuchi suggest that the challenge in the knowledge economy is to articulate and to codify this highly individualised form of knowledge and for Gibbons *et al.* to maintain that this type of knowledge is the cornerstone of Mode 2.

One of the consequences of adopting this position is that Gibbons *et al.* and Nonaka and Takeuchi overlook the important distinction that Eraut (2004: 261) has made between the tacit knowledge associated with the routine performance of a specific skill or operation, and the tacit knowledge required to analyse problems and to identify solutions[9]. Yet a careful reading of their respective texts indicates that it is the latter type of tacit knowledge that they are claiming is critically important to the production of Mode 2 and to the knowledge conversion process. This suggests that most of the knowledge to which Gibbons *et al.* and Nonaka and Takeuchi are referring is already explicit; it has just not been considered relevant or shared with others. This is an example of the second type knowledge that Eraut (2004: 263) refers to as 'personal knowledge'. The first type is the knowledge that individuals use uncritically to guide thoughts and actions when they lack the time or disposition to search for anything better; the second type is the knowledge that is called on to generate hypotheses or possible courses of action.

action'. In this sense, his usage of inference is a hybrid of the three conventional modes.

[9] In the process, they overlook that the former is often not as susceptible to capture as they imply (Eraut 2004) while the significance of the latter to economic development is often asserted rather than convincingly demonstrated (Cowan *et al.* 2000).

The use of knowledge to generate hypotheses or possible courses of action presupposes, as the discussion of Brandom highlighted, inferring what follows from, in his terms, 'representations' or in the terms of Gibbons *et al.* and Nonaka and Takeuchi, professionals' tacit knowledge. The social practice of inference entails, as the discussion of Zuboff in Chapter 3 and the discussion of Knorr Cetina's observations about traders earlier in this chapter indicated, the development of the following capabilities. They are to interpret data, to present data to others who are not familiar with its meaning, to respond to others' interpretations of the presentation of that data, to establish connections between respective interpretations and then to agree appropriate courses of action. This presupposes the development of, to borrow the language of Zuboff (1988: 192), a form of 'intellective mastery' based on a combination of theoretical and tacit knowledge that allows us to identify alternative courses of action that could result in innovation and improvement. Given that this form of social practice is culturally and historically rooted, it is necessary to consider the extent to which education can nurture the capabilities that are critical to working in the knowledge economy.

Conclusion

The chapter started by acknowledging a unifying link between the social and management theorists' respective explanations for the emergence of the knowledge economy; they both accepted the critical role of knowledge. Despite this common starting point, the chapter argued that the legacy of the two worlds of knowledge in the social and management theorists' explanations of the role of knowledge in the economy has had a number of theoretical consequences for their respective theses.

First, it maintained that Cartesian legacy in the social theorists' ideas about the knowledge economy led Bell, Castells and Stehr to concentrate upon the transformative effects of science in the economy, for example, more knowledge-based products and services and more knowledge workers. The

chapter accepted that these examples were reasonable manifestations of a knowledge economy, nevertheless, it argued that the Cartesian legacy led Bell, Castells and Stehr to gloss over why the transformation in advanced industrial societies they drew attention to had occurred.

The chapter used Knorr Cetina's ideas about 'epistemic cultures' to explain that if we are to understand how knowledge has woven itself into the tissue of economic and social life in the way that the social theorists maintain, we have to consider the link between epistemic cultures and epistemic activity. Knorr Cetina maintained that once we shift the focus to the role of epistemic cultures we are able to appreciate that the diverse, albeit different, forms of epistemic activity that occur in scientific contexts and other forms of work. Furthermore, it followed from Knorr Cetina's argument that for knowledge to flow within and between epistemic contexts, scientists and other professionals had to engage in the social practice of reasoning.

Second, the chapter maintained that the postmodern legacy led Gibbons *et al.* and Nonaka and Takeuchi to symmetricalise all forms of knowledge, to sever tacit knowledge from theoretical knowledge, and to argue that tacit knowledge was equally as important as scientific knowledge in the knowledge economy. While the chapter accepted that the social theorists had disregarded the important contribution that tacit knowledge makes to the production of new knowledge, it highlighted the inadequacy of the management theorists argument about tacit knowledge by pointing out the interdependency of tacit and theoretical knowledge in the knowledge economy.

The common link between the management theorists' explanations of the emergence of the knowledge economy and Knorr Cetina's analysis is the issue of inter-professional communities and inter-professional collaboration. This issue is gradually being exacerbated by what Hage and Powers (1992: 4) refer to as, the 'complexification' of work and work roles in advanced industrial societies. They identify two expressions of this process of increasing specialisation: on the one hand, it has reduced experts to lay status on many

matters; and, on the other hand, it is responsible for fostering greater inter-professional collaboration. One consequence is that professionals are continually forced into settings where they have to borrow Seely Brown and Cook's (2000: 586) phrase to 'bridge different epistemological traditions' as well as the traditions of professional practice.

The new focus on epistemic cultures and epistemic activity that the chapter has reintroduced the interdependence between theoretical knowledge and tacit knowledge that Polanyi and Zuboff had acknowledged. The chapter argued that the emergence of the knowledge economy is making the interdependence between theoretical and tacit knowledge much more explicit than in the past. Moreover, it highlighted that this new relationship between tacit and theoretical knowledge implies a need for a pedagogy that allows us to: (i) mediate between these two forms of knowledge; and (ii) use the outcome of mediation to create new knowledge and new activity.

Chapter 5

Higher education and the two worlds of knowledge

Introduction

The last chapter argued that a number of highly influential social and management theorists presented a one-sided explanation of the knowledge economy because they embraced only one side - science or tacit (i.e everyday) knowledge, of the 'two worlds' of knowledge. In doing so, the social and management theorists only offered a partial explanation of the new role of knowledge in advanced industrial societies because they missed what is new and distinctive about the knowledge economy/society. First, that knowledge economies/societies presupposes the existence of those epistemic cultures that enable new knowledge to be produced and applied. Second, that the knowledge economy/society is requiring the interdependency between theoretical and tacit knowledge to be made more explicit. In light of these oversights, the chapter concluded that there are a number of unresolved epistemological issues at the heart of the debate about the knowledge economy/society and unrecognised pedagogic issues within educational policy. The specific aim of Chapter 5 is to analyse the response in one area of educational policy - higher education to the emergence of the knowledge economy.

Knowledge, higher education and pedagogy

Higher education and the knowledge economy

There has been a flood of publications since the early 1990s that have attempted to consider the implications of the changing relationship between knowledge and

higher education (Barnett 1997; 2000; Delanty 2001; Fuller 1997; 2000). One of the unifying themes in these publications is a recognition that the debate about the knowledge economy/society is the latest example of the type of the 'cognitive shifts' that have occurred in modernity what (Delanty 2001). By this what is meant is the way in which changes in:

> 'knowledge production leads to changes in cultural and social structures: [and the way that] changes in the mode of knowledge bring about the articulation of new cultural models leading to institutional innovations'.
>
> Delanty (2001: 3)

These writers have inevitably differed in terms of their respective assessment of the nature of universities' responses to, and the implications of, the emergence of a knowledge economy/society for the future of the university. It is not the concern of this thesis to provide a comprehensive review of these debates, instead it draws attention to their central themes (without passing judgement upon them), in order to provide a context for assessing universities' response to the knowledge economy. The chapter follows Delanty (2000: 19) and argues that to understand universities' response to the knowledge economy it is important to take account of 'knowledge as a mode of social organisation and as a 'social epistemology', that is, a cognitive structure that is always more than science.

Arguments about the shift from one era of modernity to another can, at first sight, appear to imply that one conception of knowledge has been replaced by another, for example, that the 'liberal modernity' doctrine of the 'enlightenment' has been surplanted by the 'postmodern' doctrine of 'performativity' (Delanty 2000: 21-3)[1]. Such a conclusion is misleading. Delanty's idea of cognitive shifts is a more nuanced explanation of cultural change. It alerts us to the way in which the

[1] According to Delanty (2000), the era of classical modernity ran from the Renaissance to Reformation, the era of liberal modernity lasted roughly from the French Revolution to the end of the nineteenth century, the era of 'organised modernity' ran from the end of the First World War to early 1970s and that we are now living in the era of 'postmodernity'.

ideological forces that influenced and shaped the emergence of different conceptions of knowledge can result in each conception being embodied and perpetuated, often conceivably in opposition to one another, in higher education. One of the reasons that it is difficult to detect the continuing and frequently conflicting influence of different conceptions of knowledge in higher education is that policymakers pay little attention to shifts in conceptions of knowledge. Instead they tend, on the one hand, to conceive of knowledge as a 'black box' and thus never define it; and, on the other hand, present knowledge as the 'magic bullet' that will impel economic prosperity (Keep 1999). Consequently, current educational policies increasingly affirm that we are in a 'knowledge society', that more and more jobs will be 'knowledge jobs', and that therefore we all need to accumulate more qualifications. This is evident from the comments in the Foreword to the Green Paper 'The Learning Society' which states that:

'Learning is the key to prosperity - for each and everyone of us as individuals, as well as for the nation as a whole. Investment in human capital will be the foundation of success in the knowledge-based global economy of the twenty-first century.....to cope with rapid change and the challenge of the information and communication age, we must ensure that people can return to learning throughout their lives'.

DfEE, (1998: 7)

In addition, in the new White Paper for Higher Education which claims that:

"In a knowledge-based economy both our economic competitiveness and improvements in our quality of life depend on the effective sharing between business and higher education'.

DfEE (2003: 5)

One of the results of taking the link between knowledge, learning, and economic development for granted is that policymakers adopt what was referred to in Chapter 4 as, a 'design strategy' conception of policy implementation. That is, they assume that policy measures such as widening participation, frameworks to assure the quality of learning and education business collaboration can be

'designed' to produce the desired set of outcomes. One consequence is, as Moore and Young (2001:445) have presciently observed, that there is not only very little clarity within educational policy about what type of knowledge is required, there is also very little discussion as to how it should be acquired.

To explicate the meaning and implications of the longstanding and contending assumptions about knowledge that are embedded in educational policy for higher education it is necessary to elucidate the conceptions of knowledge associated with the different cognitive shifts. It is my contention that the current era is characterised by three main conceptions of knowledge. The three conceptions of knowledge can be defined as the 'traditional', the 'utilitarian and the 'postmodern'[2]. Although all three conceptions are characterised by different shifting eddies, backwaters and side channels, their paradigmatic assumptions about knowledge can be used to elucidate the pedagogic problems that recent educational policy for higher education has posed for learning and teaching in universities.

The idea of the traditional conception of knowledge reflects the debate between scientific realists and humanists in what Delenty (2000) has referred to as 'classical' and 'liberal modernity' about the respective validity of both forms of knowledge and the different grounds to justify their inclusion in the university curriculum. It thus represents a combination of ideas. First, it endorses the view implicit in liberal modernity that there is a given body of foundational knowledge (i.e. literary and scientific knowledge) that should feature in the curriculum, and which universities have a responsibility to transmit. One of the main manifestations of foundational knowledge is the assumption that what was important was submitting oneself to the discipline of a subject and becoming the type of person it was supposed to make one (Barnett 1991). Second, it consolidates the

[2] These conceptions of knowledge are partly influenced by the knowledge distinctions formulated by Moore and Young to clarify the different conceptions of knowledge that inform the current debates about the 14-19 curriculum (2001). They are also partly influenced by my interpretation of Delanty's (2000) argument about the cognitive shifts that have occurred in industrial societies.

foundational and canonical status attributed by universities to disciplines and to the scientific method. One manifestation is the assumption that disciplines constitute the only foundation for conducting research because new knowledge is formed from engagement with existing disciplinary traditions (Rothblatt and Wittrock 1993).

By drawing its strength from the different principles that informed the idea of foundational knowledge, the traditional episteme masks the way in which it embraces the scientific and humanistic knowledge in a seemingly coherent position. It simply elevates the 'best' of both of these two-worlds of knowledge into a common canon, that to borrow Moore and Young's phrase (2002: 447), 'it duly celebrates by conceiving of knowledge as an end-in-itself'.

The idea of a 'utilitarian' conception of knowledge reflects the view that surfaced in liberal modernity and was subsequently consolidated in what Delanty (2000: 24) refers to as 'organised modernity'. This is the idea that education can never be insulated from the rest of society and will always be related in some way to society's economic and political needs. Thus it accepts that economic considerations determine universities' relation to society and conceives of knowledge as a means to an end. From this perspective, the role of the university curriculum is generally held to be a contribution to realising the particular 'form of society' desired by policymakers, while the role of research is deemed to be to support the growth of industrialisation.

These fairly utilitarian ideas about knowledge have been a constant, if marginal[3], feature of the discourse about the higher education curriculum in the UK up to the late 1980s. What has changed over the last twenty years, however, is the

[3] The publication of the Robbins Report in 1963 gave considerable impetus to this conception of knowledge by arguing in favour of an extension of technological education in universities to respond to the demands of the post-war economy. The report did not, however, elevate the instrumental orientation into a principle for all of higher education.

scope and reach of the technical instrumental conception of knowledge in the higher education. Prior to the 1980s, the utilitarian and instrumental conception of knowledge was largely confined to those areas of the higher education curriculum concerned with technical and/or professional education (Silver and Brennan 1988). Its reach within the higher education curriculum received considerable momentum during the late 1980s through the push by the then Conservative Government to extend the 'vocational element' within the mainstream higher education curriculum (Barnett 1994).

The 'postmodern' conception of knowledge reflects the blurring of the epistemic and moral boundaries that characterised, albeit in slightly different ways, the traditional and utilitarian epistemes, with the result that the postmodern episteme is predicated on an opposite set of assumptions to the aforementioned epistemes. Instead of accepting knowledge as a given; that is, an accurate and verifiable representation of the world, the postmodernist episteme directs attention to the historical and cultural basis of knowledge, and argues that the world and knowledge are always a product of different ideological standpoints.

One of the main tenets of the 'postmodern' conception of knowledge is the claim that any curriculum based on the traditional and utilitarian epistemes is relying on essentially arbitrary assumptions about knowledge and culture (Hartley 1997). The status and epistemological basis of these conceptions of knowledge are however no longer tenable, according to the postmodernists, thus their legacies (i.e. structures and hierarchies of knowledge) and the part that they play in reproducing those forms of rationality in higher education must be challenged (Barnett 2000). It is argued that this loss of status has occurred because 'if there are no sure foundations and no Archimedean points from which knowledge is generated and assimilated, but instead a plurality of situated knowledges, then

the very foundation of discipline-based education are themselves undermined' (Edwards and Usher 2000: 93)[4].

Another tenet of the postmodern conception of knowledge is a tendency to translate knowledge claims into statements about 'knowers' (More and Muller (1999: 190). The values, interests and perspectives, often referred to as 'voices', associated with the excluded or marginalised groups are privileged as being equal to, or even over, the dominant or hegemonic voices of the traditional and utilitarian epistemes in universities. Hence any form of knowledge has the potential to be included in the university curriculum.

Pressures on higher education

The distinctions between the traditional, utilitarian and postmodern conceptions of knowledge can be used in a number if ways to shed light on the implications of the competing pressures to modernise higher education. The first way is to identify the changes that have occurred as regards the purpose of the undergraduate and postgraduate curriculum. The second way is to identify the pedagogic dilemma that has emerged as a result of these changes to degrees.

One of the pressures following the Dearing Review of higher education has been to retain many of the values that gave the traditional conception of knowledge its enduring strength whilst simultaneously modernising degrees by making their content more transparent for students and employers. The clearest example of the former is provided the Quality Assurance Agency's (QAA) Subject Review process which offers a degree of support for the continuation of the canonical status of the knowledge provided by disciplines (Bridges 2000: 51). The Dearing Report's concern (NCIHE 1997) with establishing the standards of all degrees to be achieved has been rigorously reinforced by the QAA in a number of ways

[4] It is easier to reference the assumptions of the postmodern episteme than the traditional and utilitarian epistemes because the former is grounded in current debates in social theory whereas the latter have been derived from a much more eclectic set of sources.

(Bridges 2000: 51). First, it has insisted that degrees define the 'subject knowledge' (i.e. course content) to be taught. Second, it has laid down the choice of subject headings to frame curricula and benchmarks for courses. These acts of reinforcement were, however, accompanied by the stipulation that all courses should be expressed in terms of 'learning outcomes' (i.e. what students should be able to do). The net effect of this development was to insist that even the teaching of subject knowledge had to achieve clear utilitarian goals.

Accompanying this pressure to maintain many of the values associated with the traditional conception of knowledge has been a determined push by New Labour to extend the utilitarian or instrumental orientation of higher education. The initial foundation for this development was laid in the late 1980s and early 1990s when the then Conservative Government sponsored the introduction of a number of measures to 'vocationalise' the higher education curriculum. One measure was the introduction of work-based learning degrees which had been explicitly designed to reflect employers' needs (Fulton 2000)[5]. Another measure was a series of attempts to make mainstream undergraduate and postgraduate degree programmes more responsive to employers' demands (Barnett 1994). One of the most notable developments was the Enterprise in Higher Education Initiative (EHE) which provided funds for university departments to develop students' 'transferable skills' (subsequently 'key skills'[6]) which many employers and employer organisations deemed were an essential prerequisite for working in the global economy (CBI 1991). A further measure was the establishment of various mechanisms to recognise or accredit various forms of what can be referred to as, 'experiential' learning or non-traditional learning that had not previously been recognised within the disciplines as part of degree courses (Bridges 2002). These mechanisms are normally referred to as the accreditation of

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[5] Adults lacking qualifications were also encouraged to enrol on conventional degree programmes, however, the evidence is rather mixed as regards how many who were at work chose to do so (ref).

[6] The terms 'enterprise' and 'transferable' skills were employed at the time. They have subsequently been replaced with the term 'key' skills. For the sake of consistency, I have chosen to use the latter term throughout the chapter.

prior learning (APL) or prior experiential learning (APEL). They were designed to accredit within degree programmes the everyday knowledge acquired through professional and/or technical work or forms of prior learning to give advanced standing in relation to university entry requirements.

The particular form of utilitarianism that has provided the dominant rhetoric for systemic change in response to the knowledge economy since the Dearing Review has been the re-appraisal of the role of disciplines as a means to develop key skills (Moore and Young 2001: 448). In an attempt to broaden the outcomes of degrees so that they developed the qualities policymakers assumed were required for working in the knowledge economy, the Dearing Review (NCIHE 1997: 14) introduced the idea of 'programme specifications'. The net effect of these specifications was two-fold: to maintain the longstanding role of disciplines to transmit knowledge by ensuring that universities spelt out the 'subject knowledge' students would acquire through studying for a degree; and, to reconceptualise the role of disciplines so that they served a more utilitarian purpose. Universities were required to identify how degrees developed key skills and the qualities of flexibility required for working in the knowledge economy, which the Dearing Review stated from now on were 'necessary outcomes of all higher education programmes' (NCEHE 1997: 14). Hence, by accepting the Dearing recommendations in full, New Labour, in effect, consolidated the instrumental orientation of degree programmes within all areas of the HE curriculum. Higher educational policy since 1997 has been predicated on an explicit link between subject knowledge, key skills and graduate employability, and universities have been required to formulate learning and teaching policies to reflect this new orientation (Mason *et al.* 2003).

In contrast to the explicit push to extend the utilitarian purpose of higher education, there has been far less overt measures to promote the postmodern conception of knowledge in higher education. Nevertheless, aspects of the

postmodern argument about the heterogeneity and the performativity[7] of knowledge has gradually surfaced in higher education policy. One example of the gradual acceptance of the heterogeneity of knowledge is the gradual erosion of the canonical status of disciplinary frameworks for degrees and growing acceptance of modular frameworks. These frameworks are perceived by policymakers and university Vice Chancellors to offer a way to extend choice to learners by allowing them to combine modules from different disciplines to support their future employability, rather than following subject-based courses that have been determined by academics (Gokulsing and de Costa 1997).

One consequence of this broadening as regards what counts as knowledge in higher education is that some commentators have argued that universities should abandon the concern for 'Knowledge with a capital 'K''. Instead, it has been suggested that we should think of universities as engaged in *knowledge processes* in different *knowledge settings*, exploiting *knowledge possibilities* (Barnett 1999: 21).

Consequences of the pressures and the resulting pedagogic dilemma

It can be argued that the cumulative effect of the pressures described above has been to create a number of tensions in university degrees. The first tension arises as a result of the clash between the firm emphasis from the QAA on specifying the subject knowledge that is to be taught and assessed within university degrees, and its equal firm emphasis to ensure that degrees are relevant for the world of work. The former perpetuates the traditional conception of knowledge that all knowledge is based on forms of generalisation that were rooted in the homogeneous and well-bounded disciplinary traditions within higher education and, moreover, which are normally presented to students in the form of an abstract representation of the world. In contrast, the latter is forcing universities to reappraise this conception of knowledge and to encourage lecturers to provide

[7] The debate about the performativity of knowledge has tended to focus more in its impact on research and quality assurance within universities rather than in relation to learning and teaching, for that reason, I have chosen not to discuss it (Morley 2003).

opportunities for students to 'connect' the subject knowledge they acquire to the world of work.

One consequence of this tension about the purpose of degree programmes is that universities are now expected to embrace into a coherent pedagogic position two conflicting ideas about the purpose of learning. The continuing influence of the traditional conception of knowledge reinforces the idea that to learn subject knowledge we have to grasp the meaning of abstract representations and know how to use them in ways that are traditionally expected in higher education, for example, when writing a dissertation. Meanwhile the constant pressure to demonstrate the relevance of degree programmes is resulting in a broadening of the systems of assessment, for example, collaborative projects, learning logs, portfolios and so forth, to allow students to connect subject knowledge to the type of problem they may encounter, in future, at work.

It can be argued that the second tension is the emergence of two versions of the 'practicality' of degrees. This tension has surfaced as a result of the clash between the post-Dearing impetus in higher education to conceive of disciplines as providing a way to develop key skills compared with the longstanding utititarian concern in universities for the 'practicality of knowledge' (Rothblatt and Wittrock 1993). Practicality was defined, from 'organised modernity' onwards, in accordance with criteria that reflected the traditionalist and utilitarian conception of knowledge. This resulted in definitions of practical knowledge being framed either in terms of the perceived 'relevance' of a disciplinary field, for example, bio-chemistry, for the economy or in terms of the 'contribution' of, for example, the natural and social sciences, to desired forms of social modernisation (Rothblatt and Wittrock 1993). One reason it was possible to derive criteria to define practicality from a combination of the traditional and utliltarian conceptions of knowledge is that they both shared a commitment to the truth of knowledge produced in universities. Hence, what underpinned these slightly different, but broadly complementary, definitions of the practical value of knowledge was

about the intrinsic value of knowledge which universities provided (Delanty 2000: 32).

In contrast, the particular version of 'practicality' that policymakers are now urging universities to develop is no longer defined in accordance with the above criteria. The Dearing Report introduced a new conception of the practical value of knowledge: the ability of students to 'apply' knowledge. The change it has ushered in can be described as a shift from 'knowledge that can be 'applied' to the 'application of knowledge'. The report identified three different expressions of the application of knowledge: the ability to communicate information to different audiences, to use 'number' to substantiate a point of view, and to use information and vommunication technology to present different types of data in a variety of ways.

This new conception of practicality problematises the longstanding assumption in higher education about the intrinsic value of knowledge which universities provided. It can be argued that the new conception assumes that any form of knowledge is malleable so long as we have developed the skills necessary to apply it in different contexts. One consequence of this assumption is that universities are now expected to embrace into a coherent pedagogic position two different ideas about the practicality of knowledge. Degree programmes are expected to assist students to understand the relevance of knowledge to the world of work as well as to enable them to acquire context-free skills (i.e. key skills) in context-specific situations (i.e. lectures, laboratories, work placements) (Guile 2001). This is a tricky balance because the former is consistent with the concern in universities to provide evidence of a student's current level of attainment while the latter constitute a proxy measure that employers can use to guage attainment in the future.

The third tension surfaces as a result of the clash between the utilitarian and postmodern versions of the heterogeneity of knowledge in higher education. The

former as represented by scientific and technological specialisms that serviced the economic needs of society became firmly entrenched alongside the traditional disciplines in the undergraduate and postgraduate curriculum from the period of organised modernity onwards. The latter attach importance to any forms of knowledge irrespective as to whether they are currently included in the higher education curriculum. The growing prominence of the latter position about heterogeneity of knowledge in certain areas of higher education has resulted in a call to replace the utilitarian concern to develop learners as reflective practitioners so that they can work in the knowledge economy with a new pedagogic approach. The goal of this 'pedagogy of (dis)location and translation', according to Edwards and Usher (2001: 147), is the 'mapping and translating discourses into one another and constantly renegotiating the meaning and significance of their work across domains'.

It is the contention of the thesis that these competing and contending pressures on higher education generate a pedagogical dilemma that reflects the legacy of the two-worlds of knowledge in the traditional, utilitarian and postmodern conceptions of knowledge. This dilemma, following Prawat (1999a: 60), can be defined, as a question of 'head fitting' or 'head splitting'. Prawat invoked these terms to reflect the traditional separation of the mind from the world. The former represents the unifying theme which, as we saw in Chapter 4, runs between rationalist and empiricist philosophies, as Prawat succinctly observes:

> 'Rationalists, turn the eye of the mind inward. Knowledge is valid if it evidences conceptual compatibility - that is, coheres with the structure one is attempting to create. Empiricists turn the eye of the mind outward. Internal configurations of the mind are valid if they correspond with environmentally given external configurations. All reality is .. nothing more than a set of 'linguistic constructions'.
>
> Prawat (1999a: 61)

The latter, according to Prawat (1999a: 63), represents the postmodern claim that:

'there is no way to get outside of language to the real truth of things and that the meaning of a word is in its use not in an image conjured up in the mind'.

It is possible to use Prawat's distinctions between 'head fitting' and 'head splitting' to demonstrate that although the traditional, utilitarian and postmodern conceptions of knowledge are expressed in very different terms from one another, they are, nevertheless, still predicated on the existence of two worlds of knowledge.

The emphasis on the acquisition of subject knowledge represents a Dearing type expression of the traditional rationalist and empiricist position that it is possible to provide truthful knowledge about the world. From this standpoint, the pedagogic challenge is, following Prawat (1999a: 60), to 'fit' the subject knowledge into our minds via our pre-existing cognitive structures or 'schemas' as he refers to them so that we can comprehend the external world. The emphasis on the ability to apply knowledge constitutes the 'other side' of the rationalist and empiricist concern to provide truthful knowledge about the world. It rests on the idea that once we have 'fitted' the skill of applying knowledge into our heads, we have acquired a generic framework that allows us to transfer the knowledge we have acquired and use it to guide our actions in a variety of different contexts. Finally, the concern to support students to translate discourses into one another and to renegotiate constantly their meaning and significance across different contexts has many affinities with the postmodern position that there is no way to get outside of language to the real truth of things. Once this standpoint has been adopted, the pedagogic challenge is, following Prawat, to 'split' the mind into a multitude of 'minds' that can form and respond to linguistic representations.

It can be argued that the 'head fitting' and 'head splitting' conceptions of the relation between mind and world reveals the way in which the pressure to modernise higher education has resulted in the emergence of a modern version of the problem of the two worlds of knowledge. The traditional and utilitarian

conceptions of knowledge assume that knowledge has an objective basis while the postmodern conception assumes that all knowledge is subjective. This leaves us with the challenge of how to relate these different forms of knowledge to one another. Paradoxically, many writers, irrespective as to which of the above position about knowledge they hold, have turned to the concept of reflection as the basis of a pedagogic strategy to address this dilemma.

Overcoming pedagogic dilemma: the 'pedagogies of reflection'

The concept of reflection has a longstanding history in education that dates back to the work of John Dewey and Emile Durkheim (Moore 2004) [8]. One of the most well-known attempts to popularise Dewey's ideas about reflection as a basis for overcoming the separation of theory from practice is Donald Schon's work on the 'reflective practitioner' (1987). Schon was primarily concerned with the practical implications of the theory/practice problem in relation to professional education in American Universities. Schon (1987: 3) argued that the curriculum manifestation of this problem leaves us floundering between the 'high ground' of theory where the solution to all problems is through research-based theory and technique and the 'swampland' of practice where there are messy problems that defy technical solution. Schon argued that this dilemma has two sources. The first source was the legacy of, what Schon (1978: 3) refers to as 'technical rationality'; that is, an:

'epistemology of practice based on positive philosophical assumptions which was built into the heart of the modern university'.

The cornerstone of this epistemology is the assumption that the scientific research techniques are independent on their context of use and, for this reason, can be applied un-problematically to resolve any social, economic or political problems. The second source of the problem for Schon (1987: 3) was:

[8] The reason that Schon is discussed first even though his work is based on Dewey's ideas about reflection is explained in the next chapter.

'an awareness of indeterminate, swampy zones of practice lie beyond its [i.e. technical rationality's] canons'.

and a recognition that professional education poorly equipped professionals to deal with such problems[9].

The solution to the separation of theory and practice in professional education that Schon (1987: 22-37) proposed was based on the formulation of an alternative epistemology. He define this as 'reflection-on-action', arguing that it constituted a pedagogic strategy for assisting professionals to resolve the dilemmas they encounter in practice. His epistemology reflected, what Schon (1987: 36) referred to as, a 'constructionist'[10] view of the reality with which professionals deal. By this Schon meant, the problems of practice are never pre-given as technical-rationalism assumed and thus susceptible to resolution through the application of the scientific method of inquiry. Professionals have to construct their interpretation of those problems as well as the modes of competence required to resolve those problems and their solutions are never 'in the book'; they have to be solved through a 'kind of improvisation' and a testing of the chosen strategies (Schon 1987:5). Moreover, he argued that the knowledge and skills professionals use define and change the situation; they are not independent of it.

The implications of Schon's epistemological conception was a shift in professional education away from a 'normative curriculum' that was based on the acquisition of theories and the application of research-based modes of inquiry, towards a curriculum that facilitated the development 'professional artistry' through a 'reflective practicum' (Schon 1987:18). Drawing on Dewey, Schon argued that a

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[9] Thus, Schon, in the same period that Bell (1973:423) was affirming the virtues of technical rational model of university education to prepare professionals to address the challenges faced by advanced industrial societies, Schon was articulating a trenchant critique of that model.

[10] Schon uses the term constructionist in a rather idiosyncractic way to refer to the ideas that professionals mentally formulate the problems they work on. He does not relate his use to the social scientific debate about constructionism.

reflective practicum was based on the principle of learning by doing which Dewey (1974:364) maintained should be the 'primary or initial subject matter' for any curriculum. The design of the curriculum, for Schon should therefor support professionals to recognise and apply standard rules, to reason from generalised rules to problematic cases and to learn how to improvise to respond to uncertain or conflicting situations of practice.

During the 1980s Schon's concept of reflection-in-action proved initially to be particularly attractive in the UK and elsewhere in the world in those areas of the higher education curriculum concerned with addressing the theory/practice divide in, for example, teacher education and medicine (Brockbank and McGill 1998). The main attraction of the concept as a pedagogic strategy as, Winter and Maisch (1993) observe, that it provided a way for professionals to reappraise the vexed question of the relationship between theory and practice by 'theorising' their practice. By this they meant, that reflection constituted the basis for encouraging professionals to use a repertoire of past examples as a set of precedents or metaphors to reframe current problems and envisage solutions to them. Furthermore, it recognised the open-endedness of professional inquiry because any solutions are provisional rather than permanent, thereby acknowledging that although participation in professional practice generated a different type of learning from academic study, this learning is equally valid.

The concept of reflection originally entered the higher education lexicon therefore as a strategy for developing the skills within professional education. The concept has, however, been increasingly called upon throughout the 1990s to provide a new pedagogic 'rationale' for higher education as universities were consistently put under pressure to make their content more relevant to the demands students will face in their future professional lives (Barnett 1997: 91). Specifically, reflection has been defined as the basis of a pedagogic strategy:

'by which experience is brought into consideration and secondly, deriving from the first, the creation of meaning and conceptualisation from experience and the capacity to look at things as other than they appear'.

Brockbank and McGill (1998: 84)

The idea of bringing experience under control has a number of attractions in the post-Dearing climate in higher education. It is sufficiently unthreatening not to de-stabilise the traditional concern for preserving the canonical status of disciplines, and it resonates with the new instrumental orientation in higher education to make the university curriculum more relevant to the world of work. Thus, reflection is perceived as the basis of a pedagogy that enables students to become conscious of their own approaches to learning and thereby promote critically reflective learning via reflection on their own practice (Brockbank and McGill 1998:73). And, also to show evidence that they have developed those 'metacognitive' skills (i.e. learning to learn) that writers such as Reich (1990) claim are highly desirable in the knowledge economy.

In addition to the concept of reflection being embraced by writers who are trying to resolve the tension between the traditional and utilitarian orientation in higher education, the concept has become central to a number of writers who have articulated the principles for what might be called a postmodern pedagogy. One example is Barnett (1997: 90) who has argued that higher education should encourage students to become 'self-critical' about their presuppositions about knowledge. Another example is Edwards and Usher (2001: 115) who suggest that universities should assist learners to 'dislocate' themselves from traditional epistemological positions and engage with the plurality of knowledges that are available.

In making this case about the value of reflection, the aforementioned writers acknowledge the tension that exists between the utilitarian and postmodern

impulses in higher education. On the one hand, Barnett argues that to adapt effectively to – and even to bring about – a world of unknowable change:

'requires self-referential capacities of a high order on the part of individuals. What knowledge of the world there is has to be take on board so as to inform the self about the self, disturbing an challenging as that may be. 'Reflection' thus becomes an educational codeword for this set of self-reflective and self-monitoring challenges'.

Barnett (1997: 91)

Yet, on the other hand, he acknowledges that students are not being asked to 'move forward' through their own volition, but rather to ensure they secure their employability in the knowledge economy (Barnett 1997: 91). A slightly different emphasis about the value of reflection as a pedagogic strategy surfaces in Edwards and Usher (2003: 142). They argue that since 'different locations bring forth only certain possibilities for certain discourses', a pedagogy informed by the concept of reflection will prepare learners to question discourses and to offer alternative interpretations of subject knowledge and/or personal experience.

There are, however, a number of problems associated with the systematic take-up of reflection in higher education that has taken place over the last fifteen years, the origin of which lies in Schon's version of a 'constructionist epistemology'. At first sight, Schon's epistemology is highly seductive. His critique of technical rationality chimes with the post-Dearing utilitarian direction of government policy for higher education and with the critique postmodernist influenced writers have levelled against disciplinary knowledge. Hence reflection appears to be consistent with the 'modernising' and 'inclusive' attitudes towards knowledge. Furthermore, Schon's concern to develop 'professional artistry' simultaneously chimes with the different aspects of the traditional, utilitarian and post-modern attitude towards knowledge. The idea of professional artistry reflects a weak version of the principle of 'spiritual' leadership that became entrenched within universities in the period of liberal modernity, in the sense that, it affirms the

value of intelligence and judgement to performance. It also offers a way to engage with the push to make degrees more relevant since it constitutes the basis of a pedagogic strategy to encourage students to identify points of connection between their studies and the world of work. Finally, the idea of professional artistry reflects the post-modern sensibility that the claim that there is a hierarchy of professions is deeply divisive because all forms of work are characterised by their own form of artistry.

The problem with these interpretations of the value of Schon's concept of reflection is that they perpetuate rather than go beyond the two worlds of knowledge. This claim can be demonstrated in a number of ways. The first way is as Schon acknowledged, that his solution to the problems he identified with technical rationality was merely to:

> 'turn the relationship between competence and professional knowledge upside down. We should start not by asking how to make better use of research-based knowledge but by asking what we can learn from a careful examination of artistry'.
>
> Schon (1987:13)

He used his distinction between the 'objectivist' basis of technical rationality and the 'constructionist' basis of the reflective practicum merely to argue for the latter to be privileged over the former in the design of professional education courses. In doing so, Schon (1987: 36) maintained a traditional Cartesian position and conceives of the mind as separate from the world and theory as separate from practice. Moreover, his emphasis on reflective action displaces the dualism between theory and practice into the realm of the personal. Citing Dewey, Schon (1987: 16) argues that we come to know the world through our initiation into the traditions of professional practice; the process of initiation acting as the 'means by which the powers of learners are released and directed'.

The problem with this solution is that it leaves us connected to the world through the realm of reflection which is the product of a self-selected attitude. In advocating a solution to technical rationality based on our experience of practice, Schon glosses over the way in which practice itself has already been conceptualised through human action, or in McDowell's (1994) words, through the 'unboundedness of the conceptual' (a term that will be discussed in Chapter 8). Consequently, Schon perpetuates the idea that practice is grounded in the realm of human experience and that theory is an abstraction from the world. In the process, he overlooks that his own arguments about reflection presuppose the connection between theory and practice rather than the systematisation of practice.

One of the limitations of any attempt in higher education to base a pedagogic strategy on a Schonian conception of reflection is, therefore, that the suggested approaches of 'reflective dialogue', 'critical self-reflection' and 'dis-locating pedagogies' are inevitably characterised by a residual dualism. Writers such as Brockbank and McGill, Barnett and Edwards and Usher who have formulated the aforementioned approaches are proceeding from an assumption that the mind and world and theory and practice are separate from and unrelated to one another. Thus, even though many of the observations they make about learning are relevant to the challenge higher education faces in responding to the knowledge economy, they still end up perpetuating rather than going beyond the two worlds of knowledge.

The second way that Schon's concept of reflection perpetuates rather than goes beyond the two worlds of knowledge is that it is afflicted by what was referred in Chapter 4 as, the 'representational paradigm'. This paradigm is informed by a cultural anthropological epistemology. A basic postulate of this epistemology is that we overcome our objective biological needs and the constraints our external environment when systems of cultural belief and knowledge are interposed between the objective world and our experience of it and action in it (Minick 1997:

299). Thus, it follows from this standpoint that the relation of the mind to the world is one in which the knowledge made meaningful by sense impressions is made meaningful by the 'constructions' that are put upon those impressions.

One consequence of the legacy of the representational paradigm in Schon's work is that there is a residual dualism informing the work of those writers who have formulate pedagogic approaches based on or as a critique of his ideas about reflection. The clearest manifestation of this residual dualism is the idea that surfaces in the work of Brockbank and McGill, Barnett and Edwards and Usher that learning involves placing a construction on an experience. For Brockbank and McGill (1998: 62), the critical issue that underpins and informs reflective dialogue is our ability to 'name' a situation so that we are able to talk about it. For Barnett (1997: 103) critical self-reflection entails 'reflecting on one's own understanding', while Edwards and Usher (2003: 140) maintain that the hallmark of dislocation is the ability to translate one textual representation into another.

It can be argued that there is one unifying theme that embodies a number of the assumptions that characterises the above approaches to pedagogy; namely that we respond to sensory impressions or linguistic utterances by making a mental representation and then sharing that construction. One of the difficulties with this assumption is, as Brandom argues, that even non-inferential reports must be inferentially articulated. The social practice of inference involves us understanding the significance of an action and/or utterance and this presupposes that we understand the concept(s) which shape and determine the character of that action/utterance. This line of reasoning suggests that the world is not devoid of meaning and value and is, in fact, laden with meaning and value. For that reason, it is necessary to consider whether there is an alternative conception of the relation between mind and world that takes us beyond the two worlds of knowledge, and an alternative conception of the relation between theory and practice that avoids the pitfalls of the 'pedagogies of reflection'.

Conclusion

This chapter has argued that there is a parallel between the legacy of the two worlds of knowledge in the social and management' theorists explanation of the knowledge economy and in the response in higher education to the knowledge economy. Chapter 4 maintained that the social and management theorists presented a one-sided explanation of the knowledge economy because they embraced either the world of objective knowledge of social structures or the subjective world of personal knowledge. Chapter 5 maintains that the legacy of the traditional, utilitarian and postmodern conception of knowledge in higher education has resulted in a pedagogic dilemma that mirrors the epistemological dilemma generated by the social and management theorists.

The chapter has advanced a number of interconnected arguments to substantiate the above claim. First, it acknowledged that although policymakers have recognised that the knowledge economy posed a qualitatively new challenge for education, they have assumed that, in the main, the challenge is to extend the existing types of knowledge and skill to a greater proportion of the population. Second, in their attempt to modernise higher education in response to the emergence of the knowledge economy, policymakers have placed a number of competing and contending pressures on higher education. The chapter has defined them as the pressure to:

- maintain the values associated with the traditional conception of knowledge;
- extend the utilitarian scope and orientation of degree programmes;
- accept a more pluralistic definition of the knowledge degree programmes recognise and accredit.

Third, these pressures have generated a number of tensions about the purpose of higher education which, in turn, have generated a series of pedagogic dilemmas. The chapter has pointed out that, irrespective of whether those

writers who have embraced a traditional, utilitarian or postmodern position as regards knowledge, their response has been to turn to Schon's ideas about reflection as a strategy. The chapter has argued that the 'pedagogies of reflection' Schon;s ideas has given rise to in higher education constitutes an inadequate basis for overcoming the dilemmas that they purportedly address. The chapter maintains the main reason for their deficiencies is that they have failed to recognise that the root cause of the pedagogic problems is the legacy of the two worlds of knowledge in traditional, utilitarian and postmodern conception of knowledge that currently dominates policy and practice in higher education. In light of this, it is necessary to consider whether there is an alternative conception of mind and world that takes us beyond the two worlds of knowledge; and an alternative conception of theory and practice that avoids the pitfalls of the 'pedagogies of reflection'.

Chapter 6

Beyond the two worlds view of knowledge

Introduction

The last chapter analysed the legacy of the two worlds of knowledge in the higher educational response to the knowledge economy. It concluded that the influence of a Cartesian conception of the relation between mind and world led to knowledge being conceptualised in the work of the authors discussed in a dichotomous way. Knowledge was presented as either having a subjective basis emanating from individuals' thoughts, emotions, beliefs and intentions or an objective basis because it represented the material world of natural, physical and social structures. One consequence of assuming that these two 'worlds' are separate and different from each other is that we are left with a specific pedagogic problem: learning to mediate between them. Writers from different epistemological standpoints in higher education have turned, albeit in slightly different ways, to the idea of what Chapter 5 referred to as the 'pedagogies of reflection' in an attempt to overcome their separation. However, they end up using reflection as a strategy to 'fit' the minds into a world that is separate from our activity or to 'split' the mind into a multitude of 'minds' in an attempt to capture the diversity of human experience.

Chapter 6 has two main aims. The first aim is to explore worlds of knowledge. The second aim is to propose an alternative theoretical approach that goes beyond the two worlds of knowledge and, in the process, allows us to address the challenge of the knowledge economy outlined in Chapter 4.

Chapter 4 acknowledged that although Schon's popularisation of the concept of reflection led to its adoption as the basis for a pedagogic approach in higher education, the concept was originally formulated by the philosopher John Dewey at the turn of the twentieth century. Dewey saw his concept of reflective thought as a way to theorise the basis of our relationship with the natural and social environment and, in the process, overcome the split between mind and world (Garrison 2001; Hickman 1990). This chapter argues that, despite offering a number of significant insights as regards the value of the concept of reflection, Dewey's theorisations do not adequately address the problems the thesis has identified as regards the legacy of the two worlds of knowledge in education.

To go beyond the problems associated with the solution that Dewey offered, the chapter takes up and analyses the ideas of Cultural Historical Activity Theory. The founding figure of this tradition is the Russian scholar Lev Semënovich Vygotsky. His ideas have been developed and extended in Russia over the years by many writers of whom the most notable are Davydov, Galperin, Leont'ev and Luria. Moreover, this collective body of work has been the source of inspiration for the further development of CHAT elsewhere in Europe (Engeström, Van der Veer and Valsiner) and in North America (Cole, Lave and Wenger, Wertsch).

The significance of CHAT, which originated in the Soviet Union with Vygotsky's work in the 1920s and 1930s, to the critique the thesis makes of the 'pedagogies of reflection', derives in part from a powerful anti-Cartesian strand in Russian intellectual culture in which it was located.

'The Russian intellectual tradition was not predisposed to conceptualise mind as a self-contained private realm, set against the objective, external world of material things, and populated by subjective states revealed only to the 'self' presiding over them'.

Bakhurst 1995: 155)

This leads theorists working in this tradition to make a number of inter-related assumptions as to why the dualism between mind and world is an inadequate way to conceive of the relationship between human beings and their environment. This chapter identifies the philosophical and conceptual foundations of these assumptions by providing an account of the main tenets of CHAT that were established by Vygotsky. This paves for the way for his analysis to be built upon by identifying a number of issues in Vygotsky's work that were rather under-developed and that post-Vygotskians have subsequently further elaborated.

The contribution of John Dewey

Introduction

John Dewey is one of several figures, including James and Peirce, who belonged to the American school of philosophy known as Pragmatism. This school rejected the assumption that had prevailed since the Enlightenment that philosophy and science could reveal absolute truths about the world (Dewey 1986:92). Dewey was concerned to establish what it was possible to discover about the world once philosophy and science were relieved of their traditional responsibilities to lay bare the grounds of true belief (Prawat 1999b: 62). One part of Dewey's (1986: 113) strategy was to formulate the concept of 'reflective thought[1]as:

[1] Dewey was part of an era where evolutionary thought was very influential in philosophy and this led him to consider how we adapted to our environment (Campbell 1995; Hickman 1990; Koschmann *et al.* 1998). He gradually developed his ideas about the role of reflection in aiding the process of adaption throughout his working life through rethinking the relationship between experience and nature. Dewey's ideas about experience, nature and reflection are contained in several books: *Experience and Nature* (1988/1925) *How We Think* (1909/1986), *Logic, Theory of Inquiry* (1938/1989) and *The Quest for Certainty* (1929/1988)[1] which were also subject to various revisions along the way. Rorty (1986:xiii-iv) acknowledges the struggle Dewey had to define what was distinctive about his concept of 'reflective thought' compared with other theories, such as behaviourism, that also addressed the relationship between thought and action. Part of his difficulty was that Dewey did not want the concept of 'reflective thought' treated as a formalistic devise for establishing truth. On the one hand, Dewey wanted the concept to be a 'middle ground' between a well-defined procedure and a set of recommendations. On the other hand, he

'The kind of thinking that consists of turning a subject over in the mind and giving it serious and consecutive consideration'.

At the start of his career, Dewey's ideas about reflection were closely linked to his ideas about human experience, he felt that our ability to create meaning through reflecting on our experiences of the world were at the very heart of what makes us human (Rodgers 2002: 848). Throughout the course of his life, however, his ideas about reflection underwent a profound change. Instead of purely emphasising the act of reflection, Dewey (1986: 198) began to emphasise, what he referred to as, the role of 'ideas' as an integral part of our interpretation of experience[2].

Reflective thought as a source of new knowledge

The process of adaption, according to Dewey, mostly occurs as we form habits, that is, routine ways of doing things (Miettinen 2000: 65). These routines facilitate continuity in thought and action and are primarily accomplished without reflection. There are occasions, as Dewey (1909: 201) pointed out, when well established habits are insufficient and a problem, an uncertainty or even a crisis[3] emerges which cannot be resolved within existing social conventions or cultural frameworks. These occasions are a necessary precondition if reflective thought is going to bring about the sense of hesitation and delay essential to creative thinking.

wanted to extend certain methods of thinking that had become more common in natural science since the seventeenth century into other areas of inquiry.

[2] Ideas came to constitute, for Dewey (1986: 92-5), the hallmark of reflective thought because they were suggestions that could serve as hypotheses during the reflective process and hence constitute possible solutions to problems, especially in the natural or social sciences. In discussing Dewey's concept of reflective thinking. The extent of this change is profoundly disputed by Dewyian scholars, see Garrison (2002) and Prawat (2001; 2002) for a fuller discussion of the different positions.

[3] The similarities and differences between the Dewyian concept of breakdown and the Activity concept of contradiction are discussed in Koschmann *et* al (1998).

The origins of his concept of reflective thought lies, as Rorty (1986: xii) argues, in Dewey's desire to extend his attachment to the method of inquiry associated with the natural sciences into other fields. For example, Dewey believed that the seventeenth century scientists not only discovered the true layout of the solar system and laws of motion but also a new method of inquiry which had spectacular advantages over previous methods. As a consequence, Dewey recommends, as Rorty (1986: xii) observes, that this method is tried out in areas where it has not previously been applied by generalising:

'the experimental side of natural science into a logical method which is applicable to the interpretation and treatment of social phenomena' (Dewey 1933:11).

Thus, not only was Dewey's (1986:94) view of the natural sciences significantly different from the prevailing one, but he also appreciated that the scientific method of inquiry could be applied equally to the analysis of social phenomena. To apply this logical method to the social world Dewey distinguished between the 'empirical' and the 'experimental' stances towards the world.

'The term experience may thus be interpreted either with reference to the empirical or to the experimental attitude of mind. Experience is not a rigid and closed thing; it is vital, and hence growing. When dominated by the past, by custom and routine, it is often opposed to the reasonable, the thoughtful. But experience also includes the reflection that sets us free from the limiting influence of sense, appetite, and tradition. Experience may welcome and assimilate all that the most exact and penetrating thought discovers. Indeed, the business of education might be defined as just such an emancipation and enlargement of experience'.

Dewey (1986: 277)

From the Dewyian standpoint, the empirical attitude of mind refers to a tendency to observe regularly occurring or coinciding things or phenomenon and draw conclusions from them, thus Dewey claims, it is very useful in coming

to terms with everyday situations[4]. In contrast, the experimental attitude of mind refers to the capacity to use the natural scientific method to formulate new ideas or conceptions) and thus not to be dominated by the past (Miettinen 2000: 68)[5].

The latter stance is central to reflective thought, according to Dewey, because it assists us in questioning the givenness of the world. Dewey conceptualises the process of reflective thought as a circular series of five steps (Dewey 1986: 200-6). The first three steps are concerned with defining and engaging with a problem (Miettinen 2000: 66; Rodgers 2002: 850)[6]. The first step is to form a tentative conception of the difficulty and define the problem that has to be addressed. To do so, we have to identify the material and social conditions of the situation that are generating the problem. In doing this we are directed to what specific:

'suggestions are entertained an which are dismissed; what data are selected and which rejected; it is the criterion for relevancy and irrelevancy of hypotheses and conceptual structures'.

Dewey (1986: 139)

The most reliable beliefs or habits tend to fail, according to Dewey (1986: 201), when we confront novel situations. Because beliefs or habits rely on past uniformities they tend to be less helpful when the current situation departs in considerable measure from routine occurrences. The third step is to avoid the trap of resorting to old habits, to address new problems by formulating a

[4] The terms empirical and experimental are often used in very different ways in modern philosophy and education compared with how Dewey chose to define them. The term empirical is often used as a definition of what Dewey refers to as 'experimental', while the term experimental can refer to engaging with the world either with a scientific set of set of procedures to guide one's actions or without such a set of procedures.

[5] Even though Dewey underlines the significance of scientific method and scientific concepts, he tends to alternate between using the terms 'concepts', ideas' and 'intellectualisations'. Miettinen (2000: 65) suggests this is because Dewey wanted to stress that concepts are always tentative and that their practical significance had to be established before their status was verified.

[6] I have only concentrated upon the first three of the five steps Dewey (1986) identifies to highlight the process of defining a problem in an educational setting. I touch upon the other two, which are primarily concerned with testing hypotheses, later in my discussion about how Dewey argues ideas are verified.

hypothesis, a guiding idea or alternative conceptualisation to gain a better understanding of that new situation (Dewey 1986: 238).

The terms conceptualisation and intellectualisation are used by Dewey to refer to the role that ideas play in providing a bridge of meaning that connects one experience to the next as well as between those experiences and nature in both public and private arenas[7]. In this context, ideas constitute a resource for going beyond the dualism because they offer a way to move back and forth across the barriers that separates mind from world (Prawat 1996: 223). They acquire this quality because, as Bentley (1954: 197) has argued, ideas are 'skin-transversable', rather than 'skin-impounded'[8] because they are not limited to individuals. This means, as he observes, that ideas can instigate and direct 'the operation of observation ... They are the proposals and plans for acting upon existing conditions to bring new facts to light' (Dewey 1986:116).

Ideas, for Dewey, only have the power to illuminate or open up aspects of the world, however, if they are translatable into verifiable things or actions. They acquire this status when they are worked up in academic and lay communities through a metaphoric process he derived from Pierce, known as 'abduction' (Prawat 1996: 223)[9]. Thus, ideas have to be socially and individually 'authored', that is, undergo verbal exegesis by the group intent on using them. Once this has occurred they can become 'grounds for belief' and a 'standard for reference' for resolving different types of dispute (Dewey 1986: 120, 235).

By drawing attention to the possibility that ideas can move back and forth across the barriers that separate mind and world, Dewey appears to provide a novel solution to the problem of dualism in philosophy and science (Prawat 1996: 223).

[7] Dewey's earlier conception of reflection emphasised that the impulse to reflect was generated by an encounter with, and the conscious perception of, the potential significance inherent in an experience, rather than the role of ideas to bridge meaning.

[8] By this Bentley meant ideas are not restricted from moving between individuals and groups.

Instead of assuming with the scientific realists that truth is a condition that must be satisfied or assuming like postmodernists that truth is impossible, Dewey offers an alternative conception: truth is an experience one has in the world and that ideas structure this experience (Prawat 1999b: 69). Dewey is offering, therefore, a more provisional sense of truth based on the functional and practical significance of ideas and hence distinguishes his position from classical idealistic theories that regarded concepts as mirror images of reality or reflections of the pre-given structures of nature (Miettinen 2000: 69).

Dewey's concept of reflective thought offers a considerable advance on the way that reflection is conceptualised by Schon, and more generally in the 'pedagogies of reflection' literature. Unlike those writers who primarily treat reflection as a methodology to verify what we have learnt from experience (Kolb 1978) or as a pedagogic strategy to assist us to deepen our understanding of, or to criticise, our learning (Schon 1987), the concept served very different purposes for Dewey. One of his basic postulates of reflective thought is that it involves the adoption of an experiential attitude, and an acceptance that the legitimacy of any form of knowledge is established through recourse to socially agreed and determined standards of reference. Thus, from the Dewyian standpoint, the key issue is the extent to which reflective thought facilitates the development of new standards to establish the validity of ideas because, for Dewey (1938:1986):

'ideas constitute proposals and plans that for acting upon existing conditions to bring new facts to light'.

At first sight the suggestion that reflection helps individuals to overcome dilemmas they confront in professional life almost appears to veer into Schonian territory. Schon based his interpretation of reflection, as we saw in Chapter 5 on Dewey's original ideas that we learn by doing. This was Dewey's initial starting

[9] The extent of the Piercian influence in Dewey's work is deeply contested, see (Garrison 2001; Prawat 2001).

point, however, and as he evolved his theory of 'transaction' (Garrison 2001:285-291) he rethought his ideas about reflection in relation to that theory. Transaction, for Dewey (1989: 114), is an:

'inquiry which ranges under primary observations across all subject matters that present themselves, and proceeds with freedom towards the re-determination and re-naming of objects comprised in the system'.

Thus, Dewey stressed that in order to know the world it is important to overcome the 'spectator' stance by questioning the givenness of the world. Reflection presupposes that we re-think the meaning of, and the relationship between, ourselves, the objects we are working with, and the context in which we are located (Garrison 2001: 288). The key difference between this position and Schon's, even though it was formulated later, is that Dewey became concerned with how far ideas constitute the instruments of human transaction with the environment, and thus enable situations to be reconstructed.

The emphasis in Dewey's concept of reflective thought on the contribution of ideas to understanding introduces a very different conception of pedagogy compared to the pedagogies of reflection, discussed in Chapter 5. They argued that we should try to fit ourselves into a pre-existing world or celebrate the diversity of our experience of the world. In contrast, Dewey emphasises the value of powerful ideas from disciplines as 'instruments' to help us address problems (Prawat 2001:810)[10]. Ideas, which for Dewey could either be disciplinary concepts or notions that by influenced by those concepts, have this potential because they can bring objects and events into sharper focus and relief, and they extend beyond the here and now to illuminate future objects and events.

[10] Prawat (2001:808-11),acknowledges that the revised version of *How to Think* reflects two major changes in Dewey's own thinking: a decisive rejection of the inductive/deductive model of concept formation and its associated pedagogic model of 'activity-based' learning. In its place, Prawat argues that

The Deweyian solution to the two worlds of knowledge is, nevertheless, less convincing that it first seems for a number of reasons. The first reason is that the solution rests on the displacement of an external dualism (i.e. mind and world) into an 'internal contradiction' within experience (Engeström 1987: Ch 4. P. 7.). It hinges, in other words, on whether we choose or are encouraged by, for example, a teacher to adopt an attitude that fosters a sense of open engagement and hence transaction with the world. Dewey relies on, therefore, a residual dualism; that is, he continues to work with a traditional epistemological structure of mind separated from the world even through he stresses the transactional nature of their interrelations[11]. The emphasis on the connection between thought and practice results in an epistemology that leaves us tenuously connected to the world through the realm of ideas, which it appears are a product of a perceptual relationship towards the world (Diggins 1994: 128).

The second reason is that ideas, for Dewey, only connect us to the world once their functional and practical significance has been established. This implies that ideas arise purely through the adoption of an experiential attitude towards the world prior to them being grounded in practical experience. There are a number of problems associated with this conception of ideas. First, it tends to play down the system of knowledge that helps to disclose the meaning of an idea to us and the process of conceptual restructuring that occurs as we learn and use new ideas (Vygotsky 1987: 229); this is a process that is much more multifaceted than Dewey acknowledges. Second, it does not entertain the possibility that our actions may 'idealise' (a term that will be explained later in the chapter) the world (Ilyenkov 1977a). In other words, meaning and value are written into the natural and social world in such a way that our activity provided us with a normative

Dewey developed an approach, that Prawat refers to as, 'ideas-based-constructivism', that gave emphasis to the value of disciplinary knowledge in any context.

[11] This argument is derived from Bakhurst's (1995) critique of Bruner who, in a similar vein to Dewey, retains a residual dualism while stressing the transactional interrelationships between mind and world.

context for how and why things are. This points to the unusual conclusion that rather than possessing the means of thought in our head we operate with the means of thought which are external to ourselves in the world (Derry 2003: 7).

In conclusion, it can be argued that although Dewey in his later work acknowledged the distinctive contribution ideas can make to overcoming the two worlds of knowledge, he did not fully follow through the implications of his own suggestion. He continues to work with an epistemological structure of mind that separates mind and world (even through he stresses the transactional nature of their interrelations), rather than provide a conceptual framework that conceptualises their relationship to one another. For this reason, the thesis now turns its attention to Activity Theory and Vygotsky's concept of mediation to go beyond the problems Dewey did not resolve.

The contribution of Lev Semënovich Vygotsky

Introduction

The origins of CHAT are widely attributed to Lev Semënovich Vygotsky (Cole 1996; Daniels 2001; Kozulin 1998; Van der Veer and Valsiner 1993). Its cornerstone is the general theory of cultural development formulated by Vygotsky to address his perception of the crisis resulting from the dualism between mind and world which dominated western philosophy and psychology at the turn of the twentieth century (Bakhurst 1991). It is generally held that Vygotsky's unique contribution was:

'in grasping the significance of the social in things as well as in people. The world in which we live is humanised, full of material and symbolic objects (signs, knowledge systems) that are culturally constructed, historical in origin and social in content. Since all human actions, including acts of thought, involve the mediation of such objects ('tools and signs'), they are, on

this score alone, social in essence. This is the case whether acts are initiated by single agents or a collective or whether they are performed individually or with others'.

Scribner (1990: 92)

A central feature of Vygotsky's cultural theory of human development was a concern for the dialectical relationship between mind and world which led him to maintain that human nature and consciousness is not fixed but arises out of changing social conditions (Edwards forthcoming). This concern for the struggle of 'opposites' in Vygotsky's thinking, in this case mind and world represents a consistent line in dialectical thought from Spinoza, through Hegel to Marx and Engels. All four writers exercising, as Derry (2003) has cogently observed, a profound influence on the development of Vygotsky's thinking about the development of consciousness as well as his ideas about the development of knowledge[12].

A unifying theme in each of these influences is the emphasis on human activity as an explanatory principle for analysing the psychological implications of cultural, social and historical factors could be theorised to explain human development. Thus it is the case that the concept of activity, along with the way in which the concept was subsequently developed by Leontiev, continues to permeate and give that work its distinctiveness amongst Vygotsky's followers in Russia and elsewhere in the world (Kozulin 1998: 8)[13].

12 Vygotsky's formative intellectual development was deeply influenced by his perception of the limitations of the different traditions that characterised Russian psychology, both before and after the revolution, as well as by his intellectual curiosity about new developments in the field of literary theory. To explore this more fully see Bakhurst (1991), Kozulin (1998) and Van der Veer and Valsiner (1993). Specifically, Vygotsky was influenced by Marx's (Marx and Engels 1967) idea about 'human praxis' (i.e. that human activity serves as a generator of consciousness); Engels' ideas about 'labour and tools' (i.e. resources we use to transform our relationship with the environment) Spinoza's ideas about 'free will' (i.e. that we actively make our thoughts and actions); and Hegel's ideas about the social basis of reason (i.e. that we develop its foundations historically and culturally).

13 It is beyond the scope of this chapter to examine all of the questions and issues raised about the idea of activity as an explanatory principle. Readers who are keen to pursue this matter are referred to Davydov and Radzikhovskii (1985), Kozulin (1998) and Minick (1987).Rather, my purpose is to draw attention to a theoretical and methodological innovations that Vygotsky introduced and that inform my

One manifestation of Vygotsky's commitment to dialectical analysis was his use of Marx's concept of contradiction in the construction of his theories, his approach to method (Van der Veer and Valsiner (1993), and in his explanation of cultural development (Schneuwly 1994). For Vygotsky, the formation of new theoretical knowledge occurred as any two opposing directions of thought unite:

'with one another in the continuous whole - the discourse of ideas. This discourse is expected to lead us to a more adequate understanding of the human psyche, that is, to transcend the present state of theoretical knowledge, rather than force the existing variety of ideas into a strict classification of tendencies in the socially constructed scientific discipline of psychology'.

Van der Veer and Valsiner (1993:392-3)

The essence of cultural development, from Vygostsky's standpoint, is the conflict between the historically evolved cultural forms of activity with which we come into contact over a period of time and the forms which characterise our current activity. Thus, Vygotsky was interested in analysing the characteristics of the social environment and identifying how we simultaneously transform and are transformed by that environment.

Over the last two decades, it has gradually been accepted by eminent philosophers such as Toulmin and psychologists Bruner who have discovered Vygotsky's rich intellectual legacy that it constitutes a significant resource for re-thinking the prevailing Cartesian presuppositions of the human and social sciences. This is primarily because they recognised that Vygotsky did not subscribe to 'Soviet Marxist dogma' and appreciated that 'the use of language creates consciousness and even free will' (Bruner 1987: 2).

discussion of his general genetic law of cultural development and the relationship between thinking and language.

His writings are, however, still relatively unknown in Europe and North America. One of the reasons is because his work is characterised by several distinctive phases which reflect shifts in his priorities and conceptual development (Minick 1985: 17-39)[14]. This on-going process of theoretical and conceptual refinement and modification has sometimes made it difficult to clearly establish the relationship between the different phases of his work to one another (Minick 1987). Another reason is that there are a number of difficulties associated with translating Russian texts into English because many words do not have direct equivalents in English (Wertsch 1998) [15]. This means that the process of translation has to take account of the received set of understandings in Russian that are associated with specific terms, otherwise a significant 'transformation' of the meaning of the original text can occur (Daniels 2001: 10)[16].

A further reason is that Vygotsky's later writings were only recently translated is because the science of pedology[17] was prohibited in the Soviet Union.

'The Stalinist Party bosses decreed it (pedology) to be a reactionary bourgeoise pseudoscience. And because Vygotsky had connected some of his work with pedology, after his death and until the mid-1950s, it was forbidden to discuss, to disseminate, or to reprint any of his work. Part of his most serious work did not see the light of day until the 1980s'.

Davydov 1996: 14)

[14] Minick (1987:17-34) traces the progress in of Vygotsky's thinking and identifies three phases in his career. The first phase lasted from1925-30, the second from 1930-32 and the final phase from 1932-34) Readers interested in understanding the shifts in Vygotsky's thinking are referred to Minick (1987), Yaroshevsky and Gurgenidze 1997) for a fuller discussion of the issues.

[15] The problem of translation and hence understanding of this book has been further complicated because it is a collection of his writings over his working life; it has to be read, therefore, with some sensitivity as regards the intellectual developments represented in various chapters (Daniels 2001:31). For example, in the case of one of Vygotsky's best known books, originally translated as *Thought and Language* and now known as *Thinking and Speech* (Daniels 2001: 31), there have been three translations all of which differ substantially in the ways in which his ideas have been interpreted and presented

[16] It is generally held that the re-translations of Vygotsky's works gathered together as the *Collected Volumes* represent the most accurate translations. For this reason, all quotations from works previously available in English, wherever possible, are taken from the later publications.

[17] Vygotsky's reputation in the West is primarily as a psychologist. However, in Russia he is also thought of as a pedologist, that is, a theorist of pedagogy and child development.

Consequently, until the late 1960s access to his works was very restricted in the West and were subject in western psychology to two quite different interpretations: one focuses on the role of 'symbol' in human development, the other stresses the 'politics of culture' (Burgess (1993: 4). A diverse range of European and North and South American scholars are now incorporating a number of Vygotsky's concepts into their own research frameworks, although they differ widely in their interpretation and application of these concepts (Cole 1996; Engestrom 2001; Wertsch 1985a and b). What appears to unite them is a conviction that Vygotsky provided ideas and insights that represent a unified theoretical vision beneficial to any attempt in the human and social sciences to go beyond the two worlds of knowledge (Minick 1987: 34).

This chapter demonstrates that Vygotsky's work constitutes an important, yet outside of its field, a still largely under-recognised and under-appreciated contribution to social theory and, in that sense, his work is relevant to the specific concerns of this thesis. Following Giddens 1984: xvii), the term social theory is used to encompass issues that are a central concern to the social and human sciences because social theory involves 'the analysis of issues that spill over into philosophy, but it is not primarily a philosophical endeavour'.

The chapter now presents an exposition of Vygotsky's theory of cultural mediation which it maintains provides a conceptual foundation to go beyond the two worlds of knowledge, and the educational problems to which it gives rise. It acknowledges that although Vygotsky's theory centred predominantly on the ontogenesis of verbal thought in children, he moved beyond this to consider the part played by words in guiding 'thinking towards adult forms of conceptualisation and behavioural control' (Burgess 1993: 22). Hence, Vygotsky produced a general, rather than an age-specific, theory of cultural development.

The theory of cultural mediation

A major influence on Russian psychology at the turn of the twentieth century was the European and American psychological traditions of behaviourism and reflexology and introspectionism. These influences resulted in a polarisation in Russia between what Bakhurst (1991: 63) has referred to as, the 'objectivist' and 'subjectivist' schools of psychology. Thus, there were, despite the commitment to dialectical thinking in Russian psychology, many affinities between the philosophical orientation of Russian and western psychology (Kozulin 1998: 11).

In an attempt to overcome the limitations of the subjectivist claim that mind was only knowable through recourse to introspection and emotions and the behaviourist claim that the stimulus response model provided the only means for a scientific understanding of human activity, Vygotsky proposed a different approach. He pointed out that the polarised views about consciousness existed between the two schools not because of where conceptually they started from, but rather the fault lies in 'their methods of analysis'. Stated another way, these schools did not distinguish consciousness as an object of study from consciousness as the explanatory principle of human thought (Davydov and Radzikhovzkii 1985: 46-7). Hence Vygotsky concluded that it was necessary to identify a stratum of reality that determines consciousness. This involved beginning with a 'non reductionist' reconstruction of consciousness.

The distinguishing features of human behaviour, according to Vygotsky, were the capacity to develop and use a range of 'psychological tools' (hereafter, cultural tools)[18], for example language, various systems for counting, mnemonic techniques, algebraic symbol systems, writing, works of art in their social and cultural life. He argued that these cultural tools mediated between the way we

[18] Vygotsky this term to refer to the products of human activity, for example, languages. The term 'cultural tools' has replaced the former term in the writings of contemporary Vygotskian scholars to emphasis the cultural dimensions of his theory and to avoid mentalistic interpretations (Daniels 2001). For this reason, I employ the term cultural in the text.

act upon and are acted upon by our cultural environment. Our cultural environment is the:

'product of human social life and the very social activity of human beings, and therefore the very act of putting the questions about cultural development of behaviour already leads us directly into the social plane of activity'.

Vygotsky (1987: 145-46).

Thus, Vygotsky maintained that it is the use of cultural tools that determines the nature of human action and enable us to reflexively understand our relation to the world. This conception of our cultural development provides the foundation for escaping from the Cartesian dualism because it undermines the subjectivist idea that the mind has its own pre-given structure or the behaviourist idea that some 'parcel of experience' provides the stimulus that necessitates some response (Bakhurst 1991: 64)[19]. As Vygotsky (1997a: 81) observed: previously:

'we had mind without behaviour. Now we have behaviour without mind. In both cases, we have 'mind' and 'behaviour' understood as two distinct and separate phenomenon'.

The emphasis upon mediation, that is, an understanding how culture enters psychological processes and shapes behaviour, allowed Vygotsky to reveal that:

'human beings can conceive of an object or situation as demanding a certain course of action, to question the correctness of their conception in the light of previous experience, and to project and evaluate alternative procedures'.

Bakhurst (1991: 64)

One of the distinctive features of human consciousness, according to Vygotsky, is that it permits us to control our behaviour from the outside; that is, we master

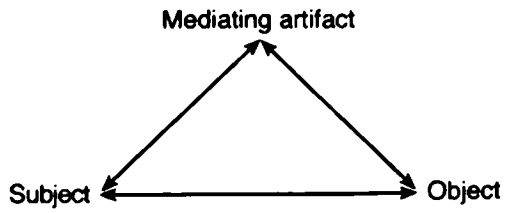
[19] Vygotsky firmly rejected the idea that the psychological solution to the philosophical dilemma of the two-worlds of knowledge could be achieved through an integration of behaviourism and subjectivism: a solution that was favoured by many Russian psychologists (Minick 1987:19).

ourselves through 'external symbolic, cultural systems rather than being subjugated in and by them' (Daniels 2001: 15.

Human activity, for Vygotsky, served as a generator of consciousness in a number of ways (Kozulin 1998: 9-11). First, the historical nature of our experience in the world results in us creating and making use of different types of cultural tools. We use tools such as language, and also different bearers of a 'signification function' - schems, maps, works of art, algebraic formulas and so on in our cultural development and in our transformation of the natural and physical environment (Yaroshevsky and Gurgenidze 1997: 351). Second our cultural development is indebted to the social and cultural environment, in other words, we become ourselves in and through interactions with others. The third characteristic of human experience that also facilitates development is its 'double nature': it is always present as an experience and in our internal cognitive schematisation of that experience.

By focusing on human activity Vygotsky established a conceptual framework centred around the use of tools (or artefacts)[20] to crystallise the connection between mind and world (Engestrom 2001: 34).

A representation of Vygotsky's mediational triangle



[20] One of the reasons why these terms are often used interchangeably is because they represent the shift between the first and third phase of Vygotsky's career. Initially Vygotsky stressed the idea of tool mediation, that is, signs and symbols whose meaning had evolved through cultural history. He subsequently broadened his focus and accepted that meaning was not pre-given and, moreover,that humans also constituted mediating artefacts (Kozulin 1998). This shift in focus has led Cole (1996:) to suggest that the concept of tool should be treated as a sub-category of the superordinate notion of artefact.

Instead of viewing the human response to the world in accordance with evolutionary theory as a process of adaptation to an external environment, or in accordance with behaviourism as a matter of reacting to a given external stimulus, Vygotsky conceived our relation with the world in terms of a triad. He represented his ideas of cultural mediation as the interaction between the triad of subject, object and mediating tools or artefacts (Vygotsky 1987:40).

The insertion of cultural tools in human action was revolutionary because Vygotsky's basic unit of analysis overcame:

'the split between the Cartesian individual and the untouchable social structure. The individual could no longer be understood without his or her cultural means and society could no longer be understood without the agency of individuals who use and produce artefacts'.

Engeström (2001: 34)

This emphasis on the transformation of the mind world dualism through the insertion of cultural tools touches upon a key philosophical issue. Scientific realists had always maintained that external reality does not contain any properties that get there as a result of human activity. In contrast, Vygotsky maintained that:

'many non-material or 'ideal', properties would not be present in a world without conscious agents, yet they have a objective existence. Although these properties may exist independent of the will and consciousness of individuals, they are not independent of human beings as such, for they cannot be characterised without reference to consciousness and activity'.

Bakhurst (1991: 153)

Instead of the world standing in opposition to us, as much western philosophy since Descartes assumed, CHAT assumes that the process of collective activity inscribes its mark on nature through the creation of culture. This conception represents a dynamic vision of human beings that create themselves by transforming nature through the creation of culture.

One way to understand what Vygotsky was driving at is through reference to the concept of 'objectivation', that is, the idea that meaning is embodied in objects as they are put into use in the social world.

'What distinguishes an artefact from a brutal physical object (e.g. what distinguishes an table from the raw material from which it is fashioned)? The answer lies in the fact that the artefact bears a certain significance, which it possesses not by virtue of its physical nature, but because it had been produced for a certain use and incorporated into a system of human ends and purposes'.

Bakhurst (1991: 160)

This line of argument implies that by inscribing significance and value into the objects of the environment and, ultimately, into the environment itself, we transform or 'humanise' the environment (Bakhurst 1995: 161). The full significance of Vygotsky's ideas about culture and objectification become apparent when viewed alongside the work of the Soviet philosopher Evald Ilyenkov[21]. This issue is returned to in Chapter 8. In the meantime, the chapter highlights the way in which Vygotsky's theory of cultural mediation can take us beyond the two worlds of knowledge.

There are three shaping dimensions to Vygotsky's theory of cultural mediation: concern for 'genetic' explanation, an emphasis on cultural-historical accounts of development and an argument for the semiotic mediation of the 'higher mental functions' (Wertsch 1985b)[22]. All three need to be borne in mind when considering Vygotsky's ideas otherwise we lose the complexity of his argument (Burgess 1993: 26).

[21] Ilyenkov was primarily concerned with rescuing Soviet philosophy from the seeping influence of positivism (Bakhurst 1991: 5), the relevance of his ideas to the thesis are discussed in Chapter Eight.

[22] This idea is translated from the Russian word geneticheskiî, which refers to the historically unfolding-nature of human development. This means that Vygotsky put forward the concept of a 'generic epistemology', that is, an attempt to understand the development of knowledge by understanding the development of human faculties (Derry 2003: 91). He argued that human interaction with the world started with interaction with others and then flowed onto interaction with the nonhuman environment.

During the first phase of his career, Vygotsky tried to explain the origin of the volitional processes that allowed us to change and vary our responses according to circumstances (Minick 1987: 20). He invoked the term the 'instrumental act' to crystallise the connection between mind and world and our use of cultural tools (i.e. his mediational triangle). The idea of the instrumental act rested on a number of assumptions about the relationship between the operation of what Vygotsky (1981:137) referred to as the 'higher mental functions'. For example, he meant the forms of voluntary attention, voluntary memory and thought and language as opposed to the 'lower mental functions', for example, initial speech and behaviour, both of which characterise human rather than animal behaviour.

The higher mental functions, according to Vygotsky, arose on the foundation of the lower or elementary mental functions because they are socially and culturally created through the use of cultural tools, rather than being preserved in the physical structure of our body (Davydov and Radzikhovskii 1985: 53). Their integration and history were bound together through the process of mediation because, as Wertsch (1985b: 24) observes, 'natural' or biological development can only produce the functions in their elementary form, it is the sustained involvement in cultural development that converts the elementary into the higher mental processes.

The development of higher level functions was attributed by Vygotsky to the dialectical interplay between thought and speech thereby allowing him to explain their development in terms of 'qualitative transformations' precipitated by changes in other capacities, rather than as a linear progression from more primitive antecedents (Bakhurst 1991: 68). This process of transformation occurs through the interconnection of the following processes. The first process is the mediation of behaviour by signs or sign system - speech, Vygotsky maintained that speech was the most important sign system because it assisted individuals to master control of their behavioural processes (Davydov and Radzikhovskii 1985:

53-5)[23]. The main attraction of the concept of the sign for Vygotsky, at this point in the development of the theory of cultural mediation, was that he accepted that signs acquire a definite meaning that evolves within the history of a culture (Davydov and Radzikhovskii 1985: 54). This led Vygotsky to see signs as a special type of stimuli determined by the instrumental act and to describe the mechanism that provided the foundation for the restructuring of behaviour through the use of psychological tools as follows:

> 'In artifical memory, mnemotechnical memory ... two new connections are established with the help of the psychological tool X (e.g. a knot in a handkerchief, a string on one's fingers, a mnemonic scheme). As is true of the connection A-B (that is stimuli), each of these new connections is based on the natural conditioned response process and is instantiated by the properties of the brain. What is novel, artificial and instrumental about the new connections is the fact ... (that an) artificial direction is given to a natural process .. by means of an instrument'.
>
> Vygotsky (1981: 138)

Thus, signs were viewed as devices for mastering mental processes and Vygotsky conceived of them as artificial, that is, social in origin, rather than occurring naturally or being produced by us in isolation (Daniels 2001: 15; Kozulin 1998: 62-3).

The main difference between material and cultural tools, according to Vygotsky, was that the former are technical devices that could be used to alter 'the process of natural adaption by determining the form of labour operations' whereas the latter imply and require 'reflective mediation' (Engeström 1987: ch 2, p.15). Thus, cultural tools alter 'the entire flow and structure of mental functions' because they presupposes consciousness of our own or another person's purposes and procedures (Vygotsky 1981: 137).

[23] I initially discuss the more formal explanation Vygotsky provided about the contribution of signs and symbols to the process of mediation. This represents his thinking in the early stage of his intellectual development when he was focusing on the stable meaning signs had within societies (Minick 1987). I introduce his subsequent thinking about the importance of socially mediated activity at a latter point in the chapter.

This change in the structure of mental functioning occurs because of the way in which cultural tools determine the structure of the new mental act. For example, the use of language to support memory results in a fundamental transformation of that mental function (Wertsch 1985b: 79). This means that cultural tools are not auxiliary means that facilitate an existing mental function while leaving the basic function unaltered: they have a transformative capacity.

Vygotsky distinguished between material tools - instruments that can be directed to control nature and symbolic tools - which are infinitely more flexible resources because they are 'inherently reversible' offering feedback upon or even controling their users (Lee 1985:76)[24]. By drawing attention to the different functions different types of cultural tools serve in mediating human activity, Vygotsky also revealed how such tools could vary according to the context in which they are used and as regards the way in which they facilitate cultural development. Furthermore, his example of the knot in the handkerchief makes clear, Vygotsky revealed that we use signs to help us to control the conditions of our 'future remembering' (Bakhurst 1991: 16) thus, enabling us to vary our behaviour or to create new patterns of behaviour.

The second process Vygotsky attributed to the development of higher level functions was the way in which speech functions to facilitate or act as a block on social interaction and communication, and hence to mediate forms of consciousness and behaviour. Vygotsky proposed that any analysis of consciousness and behaviour should start with an analysis of the functional relationship between thought and speech. By 'thought' Vygotsky meant the process of thinking, that is the cognitive activities that facilitate individuals to form a conception of the world, and to learn how to solve problems within that conception (Bakhurst (1991: 68). In contrast, by 'speech' he meant, 'overt

[24] Vygotsky recognised the close connection between the concept of objectification, that enabled tools to become objects of thought and take on a life of their own, and the concept of 'commodification'

linguistic behaviour' which is responsible for the intentional production of some vocal utterance to elicit a response from another person and hence produce meaning[25]. Nevertheless, Vygotsky argued that:

'The most significant moment in the course of human development, which gives birth to the purely human forms of practical and abstract intelligence, occurs when speech and practical activity, two previously independent lines of development, converge'.

Vygotsky (1978: 24)

This means that Vygotsky recognised that although initially thought and speech exist as two independent faculties, they ultimately converge and, at this point, thought becomes verbal and speech becomes rational, that is, intelligible within a given linguistic and cultural framework ('space of reasons')[26]. This insight led him to claim that this point of convergence occurs when speech becomes a 'tool' in individuals' problem-solving actions (Bakhurst 1991: 76). That is, when words or gestures take on a representational character and can be employed to achieve specific goals. Thus participation in social activity mediated by speech result in us beginning to apply to ourselves 'the same forms of behaviour that were initially applied to us by others' (Vygotsky 1978: 92).

The process of internalisation is the key to understanding Vygotsky's ideas about the functioning of and convergence of thought and speech (Lee 1985: 81). The process of internalisation, according to Vygotsky, enables us to take over the organisation and the means of social activity and thereby facilitate the development of our higher mental functions. Thus, it is through participation in, and internalisation of, social activity that mind is created and hence knowledge of the world becomes a possibility.

(Lee 1985). In other words, the idea tools could alienate individuals through their capacity to act back on them. This issue was also analysed in the discussion of Zuboff in Chapter Three.

[25] At this point in his career, Vygotsky rather took the concept of meaning for granted (Minick 1987:). His subsequent revisions to this position are discussed in the later section of this chapter on scientific and everyday concepts.

[26] The relation of the concept of the space of reasons to CHAT is discussed in Chapter Eight.

The general principle that informed the development of the higher mental functions was called the 'general genetic law of cultural development'. Vygotsky defined it as follows:

'Every function in the child's cultural development appears twice: first on the social level, and later, on the individual level; first *between* people (*interpsychological*), and then *inside* the child (*intrapsychological*). This applies equally to all voluntary attention, to logical memory, and to the formation of concepts. All the higher mental functions originate as actual relations between human individuals'.

Vygotsky (1978: 57)

In other words, the processes that facilitate the appropriation of the ideas and values of the community we live in do not limit or constrain our individuality. Rather they facilitate our social genesis because the development of consciousness is constantly mediated by the evolving relationship between us and our environment (Bakhurst 1991: 79). The higher mental functions are, therefore, social in two senses.

'First, like other aspects of culture, their development is part of the development of socio-cultural system and their existence is dependent on transmission from one generation to the next through learning. Second, they are nothing other than the organisation and means of *actual social behaviour* that has been taken over by the individual and internalised'.

Minick (1987: 21)

When Vygotsky spoke about the internalisation of intrapsychological processes he was not, however, reintroducing the Cartesian dualism; that is, the internalisation of some inert structure of an outer reality into our mind. The reason the dualism was not reintroduced is because Vygotsky did not conceive of consciousness as something ready-made and given a-priori. The focus on the internalisation of meaning allows Vygotsky to reveal that our inner mind is only formed as part of shared human activity: a development that also involves the reverse process of the externalisation of activity into cultural tools (Miettinen

2001: 299). Thus, the inner mind serves as a special mechanism for the reflexive control of our activity.

Mediation through cultural tools (theoretical and everyday concepts)

Vygotsky's view of thinking as a 'culturally mediated social process of communication' gradually resulted in him re-considering his initial ideas about the development of consciousness and cultural development (Daniels 2001:51). His interest in the semiotic basis of mediation led him to abandon the idea that the stimulus response unit constituted the basic building block of behaviour (Yaroshevsky and Gurgenidze 1997: 352). As Vygotsky remarked:

'In older works, we ignored that the sign had meaning ... We proceeded from the principle of the constancy of meaning, we discounted meaning.... Whereas our task was to demonstrate what the 'knot' and logical memory have in *common* now our task is to demonstrate the difference that exits between them'.

Vygotsky (1997: 130-1)

By emphasising the relations and connections between thinking and speech, Vygotsky identified a new focus for analysing the development of consciousness. The cornerstone of this new approach was that it is the 'sphere of meanings not 'signs' that the factors which change the interfunctional relationship are operative' (Yaroshevsky and Gurgenidze 1997: 353).

This profound shift in his thinking led Vygotsky (1987: 49) to introduce a new unit of analysis - word meaning (that is, concepts), as the basis for analysing the development of consciousness. This enabled him to encapsulate the specific social systems of interaction that linked thinking and speech to the development of social behaviour (Minick 1985:97; Wertsch 1985 b: 99-108)[27].

[27] Vygotsky (1987: 44) distinguished between two methods of psychological analysis. The first method was to analyse phenomena in terms of their 'elements', that is, to decompose them into separate bits. The second method was to analyse phenomena in terms of their 'units', that is, the characteristics that are inherent in the whole. He argued that it was only possible to study the dynamic interfunctional

To analyse the creation of meaning when using different types of concepts, Vygotsky switched his focus away from viewing language development as a process of mastering the existing meaning of words that had evolved within the history of a culture. Instead, Vygotsky (1987: 49) argued that the development of meaning must be analysed alongside the development of the function of words in communication.

'In may be appropriate to view word meaning not only as a *unity of thinking and speech,* but as a *unity of generalisation and social interaction, a unity of thinking and communication'.*

The central premise of this new position was that the analysis of meaning should be carried out in connection with the use of concepts in communication. Consequently, Vygotsky recast the central function of concepts. Instead of conceiving of them as having a clear-cut definition, he recognised that their meaning emerged as they were employed in social practice (Minick 1987: 26). This focus on social practice implies that in order to understand cultural development, it was important to analyse meaning by looking at the functions of different types of concepts in mediating specific types of social interaction and social practice, for example, to examine the different way words are used in the processes of generalisation, abstraction and concept formation as well as to facilitate communication and social interaction. Thus Vygotsky assumed, as Bakhurst (1991:198) observes, that human practice transforms 'the natural world into an object of thought, and by participating in those practices, the human individual is brought into contact with reality as an object of thought'.

Participation in social practices, in other words, not only shapes the type of thinking and speaking in which we engage but also the type of cultural development we experience. One consequence of this emphasis on social practice was that Vygotsky started to investigate the relationship between highly

organisation of consciousness in terms of units, since this was consistent with dialectical logic (Wertsch 1985:194).

'diversified' types of meaning in cultural development (Davydov 1990: 176). To pursue this issue he distinguished between 'scientific' (hereafter, theoretical) and 'everyday' concepts (Vygotsky 1987: 167-9)[28], and analysed how we used different types of concepts to mediate different types of social interaction and specific forms of social practice.

For Vygotsky (1987: 168), we construct everyday concepts as we participate in the varied and naturally occurring events of everyday life. Everyday concepts are formed as we use random impressions to classify natural phenomena and our experience of the world, they enable us to identify connections between natural phenomena and/or human experiences and form a 'conception' (i.e. a picture or image) to represent those connections (Davydov 1990: 178). Thus, everyday concepts are based on direct, personal experience, involving intentional and deliberate action and, as a consequence, they are not usually subject to conscious awareness or to volitional control. They are saturated in our rich personal experience and offer restricted options for generalisation (Vygotsky 1987:169).

In contrast, theoretical concepts are a part of a larger group or 'organised system' of interconnected concepts that reflect what is seen to be the 'essence' of a certain aspect of reality (Vygotsky 1987: 168). Theoretical concepts are not restricted by Vygotsky to those pertaining to the natural sciences; the emphasis on the systematic nature of concepts meant that the social and human sciences were also capable of producing theoretical concepts (Wells 1999: 29). Vygotsky (1997: 99) differentiated his idea of a theoretical concept from the traditional

[28] Vygotsky sometimes used the phrase 'spontaneous concept' as an alternative for 'everyday concept'. For the sake of consistency, I have kept to the latter term, whereas I have followed Hedegaard's (2001) argument and substituted the term 'theoretical' concept for 'scientific' concept. In the current era, the former term is not encumbered by the pejorative meaning that in some contexts is associated with the latter term. For this reason, I have chosen to refer to scientific concepts throughout the remainder of the thesis as 'theoretical' concepts. The idea of a theoretical concept is consistent with the dual sense of Vygotsky's original meaning of scientific; it is based on a generalisation and is a part of a system of knowledge.

inductivist approach to concept formation in psychology which assumes concept consists of the totality of the common traits.

This inductivist approach to concept formation, according to Vygotsky, constitutes an inadequate basis for formulating a theoretical concept because the resulting concepts are only conceptions of things, rather than an explanation of the inter-related essence of things (Davydov 1990: 183). The development of a theoretical concept has to begin with work on the concept itself through understanding the 'mediated relationship' between a concept and the object to which it refers, rather than with a direct encounter with objects (Davydov 1990:184). It is only when we recognise the object of analysis in all its 'connections and relations and only when this diversity is synthesised in a word, in an integral image through a multitude of determinations do we develop a concept' (Vygotsky 1998:53).

This concern to establish that what distinguishes theoretical concepts is that they are part of a wider system of concepts led Vygotsky to assume that such concepts were best acquired in the course of instruction[29]. Typically this is achieved through access to written materials and verbal definitions and explanations constructed in collaboration with more experienced others who can explain their meaning and their relationship to one another in a given field. This enables us to reflect on the ties to other theoretical concepts and hence be more aware of how a theoretical concept enables us to think, rather than the object to which it pertains (Van der Veer 1998: 91).

Having stressed their differences, Vygotsky (1987: 216-9) acknowledged the complex relationship which existed between the two types of concepts. First, he pointed out that, in many instances, until we have developed everyday concepts

[29] The word instruction in Russian denoted a sense of teaching and learning, in other words, an active engagement with the process of learning. In contrast, in Western traditions, instruction is normally conceived pejoratively denoting a passive form of transmission learning (Daniels 2001:10).

to a certain level in social practice, it is difficult for us to learn theoretical concepts. Vygotsky illustrated this observation through reference to the implications of mastering the conjunction 'although' in both the process of thinking and action (Vygotsky 1987: 216). Once our everyday concepts have developed to the point where we recognise the possibility that although we believe something to be the case, there may be additional factors which we need to consider, then, at that point, it is more likely that we will engage constructively with theoretical concepts.

Second, he acknowledged that although theoretical and everyday concepts are formed in different ways from one another, the process by which they are formed is profoundly interconnected. The development of a theoretical concept, according to Vygotsky 91997: 220), begins with a verbal definition. It is a:

'part of an organised system, this verbal definition descends to the concrete; it descends to phenomena which the concept represents'[30].

In other words, theoretical concepts 'grow down' into the everyday and into the domain of personal experience, acquiring meaning and significance, whereas the:

'everyday concept begins in the domain of the concrete and empirical. It moves towards the higher characteristics of concepts, towards conscious awareness and volition (*ibid*)'.

It is precisely because theoretical and everyday concepts follow different patterns of development that extremely complex relationships exist between them. We acquire everyday concepts before we acquire theoretical concepts, however, the former develop along a 'trail blazed' by the latter because they are 'restructured in accordance with the structures prepared by the theoretical concept' (*ibid*).

[30] The terms abstract and concrete have a different meaning for Vygotsky compared to how the terms are commonly used in the natural and social sciences. Concrete is not viewed as something sensually palpable and abstract something conceptual or mentally constructed. From a dialectical standpoint, concrete is the holistic quality of system interconnections, while abstract is something that has been picked out or that exists in relative autonomy from the whole (Bakhurst 1991; Engeström 1987).

This occurs because of the different degree of generality associated with each theoretical and everyday concepts and their influence on each other:

'stems from the unique relationship that exists between the scientific concept and its object ... this relationship is characterised by the fact that it is mediated through other concepts. Consequently, in its relationship to the object, the theoretical concept includes a relationship to another concept, that is it includes the most basic element of a concept system'.

Vygotsky (1987: 192)

Hence, the extent to which we appreciate the relationship between the two types of concepts determines the set of possible operations of thought available for theoretical and everyday concepts (Van der Veer 1998: 91). The reason everyday concepts have a much lower capacity for generalisation compared with the theoretical concept is the presence or absence of a system in which concepts stand in relation to. Vygotsky illustrated this claim by discussing the relationship of the word 'flower' to different types of flowers.

'It is aompletely different for the child who does not know the words rose, violet, or lily than it is for the child who does. Outside a system, the only possible connections between concepts are those that exist between the objects themselves, that is, empirical connections. Within a system, relationships between concepts begin to emerge. These relationships mediate the concept's relationship to the object through its relationship to other concepts A different relationship between the concept and object develops. *Supra-empirical connections between concepts become possible.*

Vygotsky (1987: 234)

One of the reasons these concepts develop in different ways is because the structure of the day-to-day activity in which we participate predisposes us to use everyday concepts to mediate highly subjective and personal issues and experiences (Vygotsky 1987: 220). In contrast, we are encouraged to use theoretical concepts to understand the meaning of theoretical relationships (Minick 1987). This is not a mechanistic process because each concept expresses

the characteristics of our own thought in their development in that they arise dialogically through building on the form of thinking which exists for an individual at the current point in time (Derry 2003: 96). One outcome of this process is that as we incorporate theoretical concepts into our thinking we restructure our everyday concepts. Another outcome is that as we acquire theoretical concepts and incorporate them into our thinking we are repositioned in relation to the world since those concepts provide us with new cultural tools to question the givenness of experience. The implication of these observations about conceptual restructuring and our subsequent repositioning in relation to pedagogy is explored below.

The context of mediation: the zone of proximal development

It is widely accepted that one of Vygotsky's greatest contributions to our understanding of the relationship between learning and development is his concept of the zone of proximal development (ZPD) (Bruner 1987:4)[31]. The ZPD is Vygotsky's way of acknowledging, as Derry (2003:690 has observed, that:

'learning does not consist of a discrete event within a process, but also that knowledge itself consisted of a continuing process (i.e. arose in mediation - nothing is immediate)'.

It is the mediated basis of learning and development, according to Vygotsky (1987: 191), enables a different form of conscious awareness to develop which extends our capabilities to act in the world. Hence instruction, for Vygotsky, should always move ahead of development because when it does:

'It impels or awakens a whole series of functions that are in a stage of maturation lying in the zone of proximal development. This is the major role of instruction in development. This is what

[31] Two definitions of the zpd have been distinguished in Vygotsky's writings (Daniels 2001; Wells 1999). The version that surfaced in his book *Mind in Society* (1978) emphasises the value of the concept as a way of assessing intellectual abilities and levels of development[31]. A second version of the ZPD is found in the revised edition of *Thinking and Speech* (1987:22). The emphasis here is on the mastery of and use of theoretical concepts. For this reason, the discussion of the relation between mediation and the ZPD concentrates on the second version

distinguishes the instruction of a child from the training of animals. This is also what distinguishes the instruction of a child which is directed towards his full development from instruction in specialised, technical skills such as typing or riding a bicycle. The formal aspect of each school subject is that in which the influence of instruction on development is realised. Instruction would be completely unnecessary if it merely utilised what had already matured in the development process, if it were not itself a source of development'

Vygotsky (1987: 212)

The idea that instruction should not just utilise what has already matured in the development process but should also be a source of development itself is a way of thinking theoretically about the relationship between instruction and development (Moll 1990; Schneuwly 1994). To fully comprehend the way in which the ZPD shapes cultural mediation, it is important to remember that, for Vygotsky (1990: 317), the driving force of human development was a dialectical process consisting of 'the struggle of opposites involved in the process of development'.

Because Vygotsky was primarily concerned with the cultural development he focused on children thus he confined his examples to the contradictions that surface in education and play. He argued that for a contradiction to be sensed:

'the two contradictory judgements must be viewed as particular cases of a single more general concept. As we have seen, this type of relationship among concepts is absent where concepts are not included in some type of system. It is, indeed, impossible'.

Vygotsky (1987: 235)

Vygotsky was trying to draw attention to the fact that although certain everyday concepts may appear to embody a plausible account of a specific object or event, it is impossible to relate them to one another because their respective positions on that object or event are mutually exclusive. For Vygotsky the appearance of contradictions in theoretical fields, such as psychology, as much as in everyday experience constitute the source of theoretical development and

hence greater knowledge about the world (Vygotsky 1987: 235). The challenge facing educators, according to Vygotsky, is to create the conditions for contradictions to occur between our existing everyday experiences and concepts and the insights that theoretical concepts offer (Vygotsky 1987: 209, and 220). He illustrated this process of development through the 'functional method of double simulation'.

The first movement is the result of instruction that provides us with new cultural tools and places them in situations, which we cannot resolve by ourselves. One of the ways Vygotsky illustrated this issue was through reference to Piaget's famous example of children trying to understand why different objects sink. Sometimes the children claimed it was because the object was too small on other occasions they claimed it was because it was too large. Vygotsky argues that, unless we are familiar with the scientific concepts of density and volume, we are forced to speculate as to why some things sink and others do not or why some things sink faster than others on the basis of external observable features of the object. Consequently, our judgement is purely empirical in nature: the only known relationships are those that exist amongst the objects themselves.

'The logic of perception does not know contradiction. Within this framework, the child is expressing two equally correct judgements. They are contradictory from the perspective of the adult but not the child. The contradiction exists for the logic of thought but not from that of the child'.

Vygotsky (1987: 235)

The second movement occurs because the process of instruction, while defining the direction of development, does not determine it mechanistically, it leaves a 'zone of freedom' (Schneuwly 1994; Wertsch 1985b; Valsiner 1998) that we appropriate in order to use concepts in innovative ways.

Vygotsky explains the nature of this zone of freedom through reference to the idea of the 'longitude' and 'latitude' of concept formation. The gist of his

argument is that the former allows us to locate the relationship of generality within any given theoretical concept vertically with other theoretical concepts. Thus, we can think of 'some object with the help of a concept by including the given object in a complex system of mediating connections and relations disclosed in determination of the concept' (Vygotsky 1998: 53). The latter allows us to locate a theoretical concept horizontally in terms of the link between it and the object to which it refers. Vygotsky (1987: 227) acknowledges that his use of this geographical metaphor can, at first sight, be misleading. He is not arguing that the language of 'lineal relationships' is adequate to express the more complex relations of mediating different types of concepts. Rather he is using the terms longitude and latitude to alert us to the conceptual restructuring of everyday concepts by theoretical concepts, and to the way in which the different outcomes of the mediation of theoretical and everyday concepts reposition us in relation to the natural and social world. Moreover, by acknowledging that mediation builds on the conceptual foundation we have already developed, Vygotsky avoids offering a deterministic account of mediation. The significance of this observation is returned to in Chapter 10.

The longitude and latitude of mediation is a much more challenging idea than it initially appears. Instead of viewing instruction as a matter of following a pre-set pathway, it is important to recognise that; 'Instruction does not implant new psychological functions in the child. It makes the tools available and creates the conditions to build them' (Schneuwly 1994). Development does not take place, in other words, because a zone has been established, rather it occurs the zone allows us to explore the degree of generalisation that a theoretical concepts makes available to us. Our awareness of their more systematic nature facilitates the restructuring of everyday concepts. As we gain conscious awareness of theoretical concepts the semantic aspect and conceptual basis of our language is significantly enhanced. This is partly because we become aware of the possibilities for generalisation that a new theoretical concept, such as mediation, provides compared with common sense ideas about learning such as learning-

by-doing. We can then choose to use or not to use this awareness to transform our existing everyday concepts. One result, providing we make the first choice, is that our existing concepts gain a whole series of new relationships with other theoretical concepts (Vygotsky 1987: 235). Thus, a new conceptual relationships are opened up because, to borrow McDowell's (1994) terms, the 'unboundedness of the conceptual' results in the continual transformation of social life[32].

The mediation of theoretical and everyday concepts in the ZPD is, therefore, a mutually generative process. First, we start to question whether we can take the perceived connections between our impressions about the world for the actual connections between things. This process of questioning occurs because everyday concepts only allows us to place explanations alongside one another because they do not provide any criteria for assessing different types of explanation. Second, we gradually recognise that theoretical concepts enable us to generalise more effectively than is possible with everyday concepts and that these generalisations represent a unique way of reflecting 'reality in thought' (Vygotsky 1987: 238). Thus, we recognise that there are different relationships of generality among concepts and that these influence possible options for further thinking about the world. It gradually become apparent, therefore, that the development of new theoretical concepts involves formulating new generalisations which address the contradictions either within or between existing theoretical and everyday concepts.

The process of questioning and generalising in the ZPD is partly influenced by contact with more experienced other(s) and the complex relationship that exists between what Vygotsky (1987: 257) referred to as, our 'inner' and 'external' speech. Although Vygotsky does not specifically relate his discussion of inner and external speech to the mediation of theoretical and everyday concepts in the

[32] I pursue the relationship between McDowell's (1994) idea of the 'un-boundedness of the conceptual' and Vygotsky's ideas about concept mediation in Chapter Eight

ZPD it is, nevertheless, possible to construct the contribution they make to this process from his remarks about them.

Inner speech had traditionally been viewed in psychology as 'verbal memory', 'un-socialised' speech, 'abbreviated speech' or external speech minus sound (Vygotsky 1987: 256-266). Vygotsky turned these different conceptions of inner speech on its head. He demonstrated that inner and external speech both serve different functions and have different 'planes' of development. Put simply, the former is speech for oneself while the latter is speech for others. Inner speech does not precede or reproduce external speech, rather inner speech is a 'rough draft' in thought and external speech is the transformation of thought into word (Vygotsky 1987: 272). These observations led him to argue that not only is:

'inner speech is an internal plane of verbal thinking which mediates the dynamic relationship between thought and word [it is also] a complete *restructuring* of speech'.

Vygotsky (1987: 279)

The idea that inner speech is a rough draft of external speech helps to shed light on the connection between thinking and the object of thought. Our thoughts always fulfils some function and resolves some concern or task, according to Vygotsky (1987: 280), because the purpose of thought is to unite or to establish a relationship between something with something else. The flow and movement of thought, however, "does not correspond directly with the unfolding of speech; the two processes manifest a unity but not an identity' Communication is only accomplished through a mediated path. This path, as he makes clear, consists in:

'the internal mediation of thought first by meaning and then by words. Therefore, thought is never the direct equivalent of word meaning. Meaning mediates thought in its path to verbal expression. The path from thought to word is indirect and internally mediated'.

Vygotsky 1987:2 80)

It can be argued, therefore, that Vygotsky did not conceive of the mediation of theoretical and everyday concepts in the ZPD as occurring purely through the use of external speech; that is, purely occurring in the process of instruction. He was sensitive to the way in which we use inner speech to mediate vertically and horizontally the meaning of theoretical concepts and to restructure our everyday concepts as a result of grasping the measure of generality contained by the former. In this sense, he acknowledged the existence of what Valsiner (1998) has subsequently referred to as the 'zone of freedom'. That is, a zone where through exercising our own volition we form our own judgements and conclusions about the objects of thought.

Conclusion

This chapter has argue that one of Vygotsky's major achievements was to reveal that the premises for a unified theory of behaviour and mind could be established, once it was recognised that everything in our behaviour is merged and rooted in social relations which are mediated by cultural tools. By reconceptualising consciousness and behaviour as aspects of an integral system based on mediation for knowing the world, Vygotsky took a major step in moving beyond the two-worlds of knowledge. By acknowledging that human activity creates culture by transforming nature, Vygotsky recognised that the starting point for cognition is not unprocessed sense experience, rather it is the development of the conception of the world which we 'inherit' socially and culturally from which they are a member (Bakhurst 1991: 150). Thus, his solution was not hindered by the residual dualism that afflicted Dewey's about reflection.

Vygotsky's ideas about the mediated basis of our relation with the world and his interest in the semiotic basis of mediation led him to open up an aspect of Dewey's interest in 'ideas' that Dewey had never explored. By differentiating between theoretical and everyday concepts, Vygotsky highlighted that in order

to go beyond the two worlds of knowledge we have to appreciate the separation of, and the relation between, theoretical and everyday concepts. Stated another way, that when we use theoretical concepts to mediate our existing everyday concepts those concepts are restructured to a greater or lesser extent, and the outcome of this process of mediation repositions us in relation to the natural and social world.

This insight means that, even though Vygotsky formulated his ideas about learning over a century ago, he provides us with the conceptual foundation for addressing the problem that the thesis has identified the knowledge economy has ushered in: the mediation of theoretical and everyday concepts. Instead of conceiving of the relationship between theoretical and everyday concepts in terms of the metaphors of 'acquisition' and 'participation' which has characterised many current discussions of learning (Edwards 2004; Sfard 1998), Vygotsky has introduced a new pedagogic principle: the principle of repositioning. This principle draws our attention to the Hegelian root of Vygotsky's ideas about theoretical concepts (Derry 2003: 152). He conceives of them as cultural tools that, following Brandom (who will be discussed in Chapter 8 and 9), we use to engage in the social practice of reasoning, rather than as abstract representations of the world that we acquire in their completed form.

It can be argued that Vygotskys's ideas about repositioning constitutes a significant advance over the strategies proposed by the pedagogies of reflection. They left us trying to either fit our head into an external world or split our minds in an attempt to engage with the minds of others. In contrast, Vygotsky has not only provided us with a conceptual framework that offers a unified vision of the relation between our intellectual and practical activity within the world. He has also provided us with a battery of concepts - the ZPD, vertical and horizontal mediation and inner and outer speech, to explore the way in which we learn to mediate our activity in the world.

Vygotsky was primarily concerned, as the chapter has acknowledged, with mediation in formal educational contexts such as schools and with existing cultural tools. Due to his untimely death, he was never able to explore the significance of his ideas about mediation in contexts such as work, to pursue the implications of his interest in semiotic mediation or to consider how we produce new concepts and new forms of activity. These issues will have to be considered, however, if the thesis is to substantiate its claim that Vygotsky's concept of cultural mediation allows us to go beyond the two worlds of knowledge and to address the pedagogic challenge the knowledge economy has generated.

Chapter 7

Beyond the two-worlds of knowledge (2): The contribution of the post-Vygotskians

Introduction

This chapter has two main aims: to analyse the way in which Vygotsky's concept of mediation has been developed and elaborated by a number of post-Vygotskians; and to identify the way in which these developments are relevant to the concerns of this thesis. The chapter addresses the first aim by focusing on a number of writers - Davydov, Engeström, Lave and Wenger, Leont'ev and Wertsch who are widely acknowledged in CHAT for having made significant contributions in developing the concept of mediation. The chapter identifies the concerns that led them to develop the concept of mediation and clarifies the way in which they have broadened the concept.

The chapter notes that the theorists discussed tend, in the main, to address the implications of their insights to the development of the post-Vygotskian theoretical and empirical corpus. In the process, the theorists raise a number of pedagogic issues that are relevant to any reformulation of the concept of mediation. Nevertheless, in raising these pedagogic issues, a number of the post-Vygotskians misrepresent Vygotsky's epistemological position about the relationship between activity and knowledge and, in doing so, reject Vygotsky's insight about the mediation of theoretical and everyday concept. The chapter argues that Vygotksy's original insight about conceptual mediation has to be retained along with the new insights about mediation provided by the post-Vygotksians if we are to formulate a pedagogic strategy that goes beyond the two worlds of knowledge.

The extension and reconstruction of the concept of mediation

Introduction

Throughout most of his career Vygotsky, as we saw in Chapter 6, concentrated upon face-to-face mediation in formal educational contexts. Thus he operated within a slightly restricted version of his own theoretical framework and overlooked the macro-sociological context and the way that social institutions are inextricably bound up in the process of mediation (Minick 1985: 112). Furthermore, his theory of cultural mediation often appears to occur in a vacuum because although he focused on semiotic mediation he operated without an explicit theory of discourse (Wertsch 1991: 3). Towards the end of his life, Vygotsky began to address the former issue by considering the way in which 'the psychological significance of the external world' could be incorporated into his theory of semiotic mediation (Minick 1985: 114). Hence, there has been some speculation about whether this development may have led Vygotsky to re-think his approach in a way that had some affinities with the 'theory of activity' that Leont'ev, one of his foremost colleagues, subsequently developed (Wertsch 1985b: 200).

The next two sections of the chapter discuss the work of Leont'ev and Wertsch who have developed the Vygotskian corpus through their, respective, notions of 'object-orientated activity' and 'mediated action'. The chapter uses the discussion of Leont'ev to pave the way for the discussion of Engeström who elaborated and extended Leont'ev's theory of activity, and whose ideas are central to the reformulation of the concept of mediation that is central to the core argument of the thesis. It also uses the discussion of Wertsch's ideas about mediated action to pave the way for an analysis of Lave and Wenger's ideas about the situated basis of learning and Davydov's ideas about learning theoretical concepts. The latter is

an issue that lay at the heart of Vygotsky's ideas about semiotic mediation and the thesis but that has been eviscerated from Wertsch's discussion of mediated action.

Mediation as 'activity'

The impetus for Aleksei Leont'ev's (1978; 1981) 'theory of activity' was two-fold. First, he had an intellectual concern to ground his explanation of human consciousness in relation to the social structures, which he maintained organised and constrained human behaviour and consciousness (Minick 1987: 112-14). Second, he had a political concern to distance himself from the cultural-historical focus of Vygotsky's work which was attracting considerable criticism in the Stalinist era and which had resulted in several of Vygotsky's works being banned[1].

Leont'ev perceived there was a parallel between Vygotsky's concept of the mediational triangle, which was discussed in Chapter 6, and his idea of collective activity. This link was crystallised by Leontiev extending the definition of the social beyond face-to-face interaction, based on the use of cultural tools, to include 'joint activity' (i.e. activity undertaken by more than one person) and 'object-oriented' mediation (i.e. activity mediated by its goal) (Minick 1985: 115)[2]. Thus, Leont'ev inaugurated a shift away from semiotic mediation towards a focus on the object of

[1] There are considerable differences of view as to why Leont'ev chose to distance himself from Vygotsky. For example, Wertsch (19985: 199) and Zinchenko (1995: 42) argue the main intellectual differences that surfaced between Vygotsky and Leont'ev arose as a result of the different ways they were influenced by Marx's Thesis of Feurbach. According to Wertsch and Zinchenko, Vygotsky was primarily influenced by the Sixth Thesis which stressed the 'social origins of human consciousness', while Leont'ev was influenced the First Thesis, which stressed the primacy of 'human activity of praxis' as the determinant of consciousness. According to Wertsch, this accounts for the difference of emphasis as regards the role of semiotics and social practice in their respective writings. In contrast, Kozulin (1986: xliv-xlv) argues Leont'ev, unlike Vygotsky, conceptualised the development of consciousness as though it occurred through the development of a system of psychological operations which he claimed were determined by the 'actual relations between a child and reality'. This thesis fitted the credo of dialectical materialism much better than Vygotskly's more complex approach in the Stalinist era and Kozulin suggests the acceptance of this conception of human development was responsible for Leont'ev developing his 'theory of activity'.

[2] The significance of the parallel between Vygotsky's mediational triangle and the context of mediation was rather underdeveloped in Leont'ev's work because Leont'ev was primarily interested in researching the development of personaility and this led him to concentrate on the investigation of undividual action (Koschmann *et al.* 1998). However, even though he offered a critique of Vygotsky's focus on semiotic mediation (Van der Veer and Valsiner 1992), Leont'ev (1997) always acknowledged his, and other Soviet scholars, immense intellectual debt to the way Vygotsky attempted to bring together the social theory of Marx and Engels with a psychological analysis of the development of thinking and consciousness.

activity and how it was analysed and what actions it elicited (Edwards 2004). He explained this through reference to his concept of 'object motive'.

'The main thing which distinguished one activity from another, however, is the difference of their object. It is exactly the object of an activity that given it a determined direction. According to the terminology I have proposed the object of activity as its true motive'.

Leont'ev (1978: 62)

Leont'ev insisted that our activity was more important than semiotic mediation because 'beyond the development of meaning, beyond social interaction, there lies the development of especially organised forms of activity' (Leont'ev 1983: 741, quoted in Minick 1987: 300). In effect, Leont'ev argued that unless we recognised the primacy of activity over semiotic mediation we ran the risk of losing sight of the way in which activity shapes mediation[3].

He drew a distinction between the following three terms: 'activity', 'action' and 'operation'[4]. At first sight, these distinctions are a little confusing since the term activity has two meanings: one refers to human activity in general (i.e. the theory of activity) while the other refers to specific activities (education, work etc) which constitute the first level of the theory. What distinguishes one specific activity from another, according to Leontiev, is its object because the object of an activity:

'is related to a motive that drives it. Individual action is driven by a conscious goal. Although actions are aroused by the motive of an activity, they seem to be directed towards a goal.. the one and the same action that can serve different activities'.

Leont'ev (1978: 64)

The idea of mediation through activity manifests itself in two ways in Leont'ev's work, each way reflecting a strong teleological orientation (Wertsch 1995: 130).

[3] Engeström (1999: 24) has maintained that Leont'ev was more sensitive to semiotic mediation than his own writing and his critics have given him credit for.

[4] For a fuller discusion of Leont'ev's theory of activity see (Koschmann *et al.* 1998; Wertsch 1981b and 1985a).

One manifestation emerges in the line of development that exists between activity to actions and is a consequence of the prevailing division of labour (Engeström (1987: ch2.p.18). We make sense of the specific activities in which we are engaged, for example, education, as we represent the relations between the object, learning Pythagorous's Theorum, and the actions, calculating angles, required to accomplish that activity. Representing the object and actions of an activity presupposes that we can mediate the connection between the collective motive and goal of activities and action(s), for example, the purpose of mathematics and the action of measurement. Thus, it follows human consciousness has, for Leont'ev, an 'engaging and representational mediational aspect' (Axel 1997: 137). It is through the conscious construction of the meaning of the motive and goal of actions that we are able to make sense of and evolve the activities in which we are engaged.

The other aspect of mediation through activity emerges in the counter movement from actions to activity and is a consequence of our agency. This counter movement is possible because our actions are never totally determined by the division of labour. There will always be instances when:

'a person undertakes to perform some actions under the influence of a certain motive, and then performs them for their own sake because the motive seems to have been displaced to their objective. And that means that the actions are transformed into activity'.

Leont'ev (1981: 238).

Although Leont'ev acknowledges the possibility that what originates as a local action can become transformed into a new socially and culturally legitimate activity, he does not explore the way this may occur (Axel 1996: 138). Nevertheless, he does recognise that we are only likely to create new activities if we are able to:

'engage in certain, special activity, some special act. This is an act of reflecting the relation of the motive of a given, concrete activity to the motive of a wider activity, that realises a broader, more general life relation that includes the given, concrete activity'.

Leont'ev (1981: 238)

Stated another way, we are unlikely to change any activity unless we have access to a space that allows us to rethink the purpose of that activity and redesign the actions required to realise that new purpose.

Leontiev's focus on 'object-orientated activity' is helpful in that it extends Vygotsly's ideas about semiotic mediation by reminding us that we live in a mediated natural and social world. It also alerts us that Vygotsky's theory of semiotic mediation is not restricted to the use of cultural tools such as theoretical and everyday concepts in educational contexts. The focus on 'object-orientated activity' led Leont'ev to maintain that it is possible to form a meaningful, social, and historical constitution or interpretation of the world in which we live without relying on language, concepts or cultural symbols (Minick 1987: 298).

'Although language appears to be the carrier of meaning, language is not its demiurge. Behind linguistic meanings hide socially developed methods of action (operations) in the process of which people change and perceive objective reality'.

Leont'ev (1978: 85)

By playing down the relation between consciousness and language that Vygotsky identified, Leont'ev distanced himself, however, from Vygotsky's argument about the value of theoretical concepts. That they facilitate thinking by: 'including an object in a complex system of mediating connections and relations, the significance of which is disclosed as we begin to reason with those concepts' (Derry 2003: 169). Leontiev did appreciate, however, that there is not an automatic relationship between our activity and the world: to produce knowledge we have to engage in, what can be defined as a special act of reflection. That is, an act that is very different from Dewey's notion of reflection because it specifically focuses on the relation of the motive of a specific activity to the motive of a wider activity of which it is a part. Engaging in such an act of reflection, however, presupposes access to some form of 'off-line' space so that we can rethink and redesign the activity in question (Engeström 1987). The implication of the link he identified between reflection on

the object of activity and mediation was never explored by Leont'ev; it constitutes, however, one of the starting points for Yrjö Engeström's theory of expansive learning which is discussed later in the chapter.

Mediation as 'dialogue'

From the outset of his career, one of James Wertsch's (1991: 5) primary concerns has been to extend Vygotsky's ideas about semiotic mediation by linking it to theory of discourse. He has approached this task through incorporating insights from other disciplines, especially linguistics, to contribute to the construction of a coherent theory of human mind and human action' by avoiding the tendency in psychology to 'focus narrowly on the individual or on specific mental processes in vacuo' (Wertsch 1991: 3).

Since the early 1990s, Wertsch, writing alone or in collaboration, has pursued this goal through formulating what he refers to as a 'sociocultural theory of mediated action'[5]. His theory in part reflects his (Wertsch 1996: 26) concern about an ambivalence in Vygotsky's writings between a position that, on the one hand, affirms 'human rationality as the *telos* of human development'; and, on the other hand, emphasises human capacity for meaning making (Derry 2003: 13).

One result of this tension is Vygotsky appears to 'advocate a kind of universalism that is antithetical to the arguments for social situatedness, that he was pursuing' (Wertsch *et al.* 1993: 343). This tension manifests itself, according to Wertsch and colleagues (1995: 10), because Vygotsky treats language as a generalised semiotic system and assumes that the acquisition of theoretical concepts represents the apex of human attainment. Thus, Vygotsky does not, for Wertsch, provide us with a conceptual framework to identify the way in which semiotic mediation will vary as

[5] One of the difficulties with Activity Theory is that the field abounds with a proliferation of terms that have not only been very carefully defined to demarcate a theoretical position, but also to emphasise differences of opinion among writers. Wertsch argues that he defines his theory as 'socio-cultural' because

a function of cultural, historical, and institutional setting and, in the process, result in the production of a number of diverse and rich modes of communication.

To avoid these shortcomings, Wertsch and colleagues (1993: 343) argue that it is necessary to explain the distinctive ways we employ speech in the course of particular forms of action in cultural, institutional and historical situations. Accomplishing this goal involves the development of a social conception of mind and human agency which requires cultural tools such as language to be seen as both products and sources of socio-cultural contexts (Derry 2003:36) [6].

The implication of formulating human agency as an 'irreducible aggregate' of an individual and tools or individuals together is explored by Wertsch (1991) through reference to Bakhtin's (1981; 1986) concepts of dialogicality, voice and speech genres[7]. He argues they provide a way to understand how engagement with language enables us to formulate a diversity of interpretations which, in turn, mediate actions in profoundly different ways.

The first way Bakhtin helps in this regard, according to Wertsch, is to point out that for communication to occur, the context for communication has to be created interlinguistically. For Bakhtin, the meaning of an utterance is never pre-given; utterances always express a point of view because they are 'constructed and reflect the voice that produced them and the voices to which they are addressed and consumed' (Wertsch 1991: 51)[8].

he wants to reject notions of 'evolutionism' and 'psychic unity of mankind' that characterise the Russian tradition (Wertsch *et al.* 1995; 10).

[6] Wertsch employs the phrase 'mediational means' rather than cultural tools, for the sake of consistency in the thesis, I use the term cultural tools.

[7] Hasan (1992) argues the solution Wertsch proposes brings as many problems as it resolves.

[8] Shotter (1993: 381)points out that Bakhtin's concept of voice implies a nonreferential theory of language. By this he means that Bakhtin, views voice as a 'semantic position' a point of view about the world, whereas other linguists, such as de Saussure, view language as referring to objects within the world. Although it may seem undeniable that words are used referentially, Bakhtin would say that this is only possible because they are used within a form of life already constituted by the speech genre within which such words are used. This point will be returned to in the discussion of Brandom in Chapter 9.

Knowing how to locate an utterance in a context in which it is meaningful is not straightforward because Bakhtin (1981: 275), as Wertsch (1991: 54) notes, acknowledges that dialogic orientation presupposes that we can further distinguishing between 'social' (e.g. local discourses) and 'national' (e.g. English, French, German) languages. The key issue for Bakhtin is that the production of an utterance in either type of language presupposes that we have developed the capability to 'ventriloquate' (Bakhtin 1981). By this he means to postulate grammatical and semantic systems or discourses pertaining to certain sections of society with the intended meaning to achieve an intended purpose.

The concepts of voice and dialogicality are used by Wertsch to demonstrate the link between speech and context. One way he illustrates this link is in relation to the tendency in social science (see the discussion of Castells in Chapter 4) to conceptualise communication in terms of the 'conduit' metaphor (Reddy 1979)[9]. This metaphor, according to Wertsch, assumes language functions like a conduit transferring thoughts and/or information from one person to another thereby presupposing the commonality of goals between speaker(s) and listener(s).

Commonality of goals is not, as Wertsch observes (1991: 74) a given feature of social settings, even ostensibly normative settings such classrooms. For communication to occur, all parties have to appreciate the way in which the particular mode of language use creates meaning, and the range of meanings created subsequently mediate action. Thus, it follows for Wertsch (1998) that, even when there is commonality of goals, language use does not necessarily facilitate forms of understanding and action that are consistent with a speakers' intention.

9 The impetus for the 'conduit' metaphor lies in the work of Shannon and Weaver's (1949) mathematical theory of communication which, according to Wertsch (1991), stresses that ideas could be expressed unequivocally and communicated unambigously. The apparent simplicity and generalisability of this metaphor has shaped the wider public perception of the process of communication.

The second way Bakhtin contributes to our understanding of the way in which language mediates action is by revealing how linguistic conventions characteristic of different types of situations such as 'speech genres' shape unconsciously the pattern of communication. The production of any utterance always entails the invocation of a speech genre because our utterances:

'have definite and relatively stable typical *forms of construction of the whole* ... We use them confidently and skillfully *in* practice, and it is quite possible for us not to even suspect their existence in *theory*'.

Bakhtin 1986: 76, quoted in Wertsch (1991)

It is impossible, according to Wertsch (1991: 84), for us to 'speak from nowhere' since the idea of the 'literal' meaning of a word or phrase is untenable. The conditions for speech are shaped by the speech genres, which constitute 'linguistic tool kits' that denote competent linguistic performance in specific sociocultural settings and, moreover, these genres mediate thought and action in subtle, but distinctive, ways (Wertsch *et al.* 1995: 25).

The idea that 'linguistic tool kits' influence communication suggests that language has the power to empower or constrain action. As Wertsch observes:

'Each cultural activity (e.g. science, arts, everyday life, religion) poses specific tasks that can be solved only by using the corresponding modes of thinking. For instance, practical thinking or common sense is not sufficient to solve scientific tasks, whereas scientific thinking is of little use when writing a poem or sermon or solving everyday problems'.

Wertsch *et al.* (1993: 351)

Thus, for Wertsch, cultural tools constitute a series of mutually separate forms of knowledge each characterised by their own mode of thinking and specific logic which do not mutually inform one another. Wertsch (1998: 143-47) argues that new representations of the world are produced when we use speech genres creatively. For this to happen, we have to identify the way in which speech genres privilege

certain 'patterns' of communication and develop the 'analytical tools' that will allow us to 'free ourselves from undesirable patterns and create new patterns'.

The emphasis on the way we use language extends Vygotsky's ideas about semiotic mediation by highlighting that it is the qualitatively different ways that we 'ventriloquate' when using speech genres that constitutes the basis of communication. This is helpful in a number of ways. First, it implies a broader pedagogic goal for learning compared with current preoccupation in higher education policy with the acquisition of subject knowledge. Wertsch reminds us that learning is not purely a matter of processing subject knowledge, we communicate our understanding of, and our application of, that knowledge through ventriloquating in a variety of ways. In other words, using the appropriate speech genre to communicate to a academic, a professional or lay audience. Second, Wertsch's ideas about speech genres remind us, as Chapter 5 pointed out, that communication does not consist of literally placing our own constructions onto unprocessed sense data (i.e. our accounts of our personal experiences). When we construct our interpretation of our experience we do so through recourse to accepted patterns of expression and these shape and influence the meaning of our interpretations. The above observations suggest that the emphasis in higher education policy on the development of key skills is a rather inadequate conception of and response to the development of our ability to communicate to different audiences. Furthermore, that the current interest in reflection in higher education has been conceived in accordance with a rather narrow conception of the way in which we use language in communication.

Despite generating important insights as regards the implications of voice and speech genres for pedagogy, Wertsch's theory of mediated action does not totally provide the answers to the problems outlined above. It leaves us like the pedagogies of reflection with a series of separate and unrelated worlds of knowledge. This fracturing of knowledge occurs because by assuming that Vygotsky was attached to some form of abstract rationality that viewed theoretical

concepts as the apex of human attainment, Wertsch dismisses the significance of Vygotsky's the distinction between theoretical and everyday concepts (Derry 2003: 47-9). In doing so, Wertsch maintains that the formation of knowledge is based on the generation of representations of the world and that these 'systems of knowledge can be regarded as a form of culture in mind, something constituted through participation in practice (Hatano and Wertsch 2001: 79). Thus Wertsch 'restricts knowledge to the individual local and contextual 'meaning making' of participants (Derry 2003: 47).

One of the reasons that Wertsch misrepresents Vygotsky's ideas about knowledge is that he wrongly accuses Vygotsky of assuming that the foundations of knowledge were pre-given, based on an abstraction from context. Vygotsky, however, was concerned, as Derry (2003: 47-9) has cogently argued, to identify the way in which foundations are not only historically and culturally built up, but also subject to constant revision through our activity in the world.

This erroneous assumption of Vygotsky's epistemological position has a number of theoretical consequences for Wertsch's own argument. First, by accusing Vygotsky of using the distinction between theoretical and everyday concepts to justify former as the apex of human attainment, Wertsch fails to appreciate that Vygotsky was trying to grasp the separation as much as the relation between theoretical and everyday concepts. This means that Vygotsky was able to demonstrate the way in which theoretical concepts also put us in contact with the social and natural worlds because they allow us to act in different ways in relation to those worlds.

A second consequence is that Wertsch is unable to explain the way in which we inscribe meaning and significance in the natural and social world in such a way that we do not have to create the social world afresh each time we communicate with other people (Bakhurst forthcoming). This idea that the natural and social worlds are imbued with significance implies that our activity is guided by some form of

'reason' which we do not create discursively every time we act. The implications of this suggestion that the existence of requirements on thought and action allows us to infer either what follows from believing something to be the case or how to problematise what others take to be the case are pursued later in the thesis. The next section of this chapter takes up an issue that is central to but rather underdeveloped in Wertsch's theory of mediated action; namely the issue of situated basis of cultural activity.

Mediation as 'situated participation'

The debate about the embeddedness of knowledge and the situatedness of learning has a longstanding history in CHAT. Many commentaries on Vygotsky's ideas about the development of cognition have suggested that felt it was possible to acquire decontextualised knowledge and to think in ways that were context-free. In particular, Wertsch referred to the principle of the decontextualisation of cultural tools as an overarching principle of Vygotsky's theory and defined it as 'the process whereby the meaning of the sign becomes less and less dependent on the unique spatiotemporal context in which they are used' (Wertsch 1985b: 33).

The issues of abstraction and decontextualisation have been debated extensively over the last decade in CHAT (Daniels 2001; van Oers 1998) and in closely related fields such as the research literature on 'situated cognition' and 'distributed learning'[10]. The chapter concentrates on the former since Lave and Wenger's volume (1991) *Situated Learning: Legitimate Peripheral Participation* has been very influential in forcing a reappraisal of the link between mind and society in CHAT (Cole 1996; Daniels 2001) and cognitive science (Anderson *et al.* 1996) as having [11].

[10] The main texts that have discussed the situated basis of cognition are Rogoff's (1990) *Apprenticeship in Thinking* and Kirschner and Whitson's (1997) *Situated Cognition: Social, Semiotic and Psychological Perspectives*, while the main text that has discussed the 'distributed' basis of learning is Hutchin's (1995) *Cognotion in the Wild.* There are a number of affinities between these two areas of research, readers interested in exploring the similarities should consult Daniels (2001), Nardi (1997).

[11] Jean Lave and Etienne Wenger are, respectively, a cultural anthropologist and cognitive scientist who were contemporaries at the Palo Alto Research Laboratory in the 1980s. The starting point for their collaboration was their mutual interest in the debates about learning at work; they became concerned to

Lave and Wenger (1991: 33) acknowledge the influence of Vygotsky's theory of cultural development, namely that 'individuals, activity and the world mutually constitute each other', on the development of their ideas about the 'situatedness' of learning. They argue, however, that their conception of situatedness problematises, what they refer to as the dominant 'folk epistemology of dichotomies which surface in the work of Vygotsky as much as in other psychological traditions (Lave and Wenger 1991: 47-8). By this they mean the dichotomies between 'abstract' and 'concrete' knowledge and between 'internalisation' and 'externalisation'. These dichotomies, according to Lave and Wenger (1991: 105), result in learning being narrowly conceived as the acquisition of propositional knowledge, which is subsequently applied in other contexts.

By focusing on the relationship between learning and the social situations in which it occurs and the social practices that facilitate learning, Lave and Wenger argue that they have overcome the folk dichotomies and hence closed the gap between mind and world. They define the social situation, or in their terms, the 'community of practice' in which this form of learning occurs as.

'a set of relations among persons, activities and the world, over time and in relation to other tangential and overlapping communities of practice. A community of practice is an intrinsic condition for the existence of knowledge, not least because it provides the interpretative support necessary for making sense of its heritage'.

Lave and Wenger (1991: 98)

Thus, they introduce a radically different notion of learning that does not focus on 'solo performance' (Matusov 1999) nor on the acquisition of concepts (Sfard 1998). Situated learning has as its central defining characteristic a process of 'coparticipation' which Lave and Wenger call 'legitimate peripheral participation':

'rescue' a specific form of learning at work – apprenticeship - from the general confusion and uncertainty that surrounded that term (Lave and Wenger 1991: 29).

'By this we mean to draw attention to the point that learners participate in communities of practitioners and that mastery of knowledge and practice requires newcomers to move towards full participation in the sociocultural practices of a community. 'Legitimate peripheral participation' provides a way to speak about activities, identities, artefacts, and communities of knowledge and practice'.

Lave and Wenger (1991: 29)

We do not acquire, for Lave and Wenger, a discrete body of knowledge which we subsequently apply, instead we acquire the skill to perform by engaging in a working and learning process under the 'attentuated conditions' of legitimate peripheral participation (Hanks 1991: 14).

The concept of situated learning is a subtle and complex notion: situatedness is not an 'empirical attribute' of everyday activity. The meaning of a situation is shaped by the historical constitution of that setting as much as the impact of the immediate forms of social and political power existing within that setting. The concept denotes, therefore, a general theoretical perspective about 'the relational character of knowledge and learning, about the negotiated character of meaning, and about the concerned (engaged, dilemma-driven) nature of learning activity for the people involved' (Lave and Wenger 1991: 33).

Moreover, Lave and Wenger (1991: 98) argue that participation in the social practices[12] associated with expert practice in which knowledge exists is an 'epistemological principle of learning'. Participation is epistemological because since knowledge and skill are situated and thus acquired in specific situations, it is the changes in the mode of participation that enables legitimate peripheral participants (i.e. learners) to use the knowledge and skill they have acquired to mediate their relationship to the world.

[12] Following the distinction made by Rouse (2003; 189), it can be argued that Lave and Wenger follow the social scientific tradition of Bourdieu and Giddens and conceive of social practices as regulating

For learning to occur, it is essential to participate in changing activities and to gain access to what Lave and Wenger (1991:101) refer to as the 'technologies of practice'; by this they mean, the principles for the organisation and co-ordination of cultural tools in specific cultural practice. Our use of those cultural tools is influenced by the opportunities made available for us to 'connect with the history of the practice, and to participate more directly with its cultural life' (Lave and Wenger 1991:101).

Facilitating access to 'technologies of practice', entails communities providing opportunities for 'improvisational development' on behalf of newcomers through offering access to a 'learning curriculum'; this refers to the cultural tools, discourses and technical artefacts that support the development of knowledge, skill and identity (Lave and Wenger 1991: 97) [13]. The implications of the idea of a learning curriculum are explored through a discussion of the relation between language and activity. Language, for Lave and Wenger (1991: 105), is 'linked to the legitimacy of participation and with access to peripherality [rather] than to knowledge transmission in the community of practice'.

They clarify this claim by arguing that within a community of practice there are no special forms of discourse aimed at assisting apprentices to become accepted members of that community. For newcomers the purpose is not to 'learn *from* talk' as a substitute for legitimate peripheral participation; rather it is it is to 'learn *to* talk' as a key to legitimate peripheral participation (Lave and Wenger (1991:109). Thus, from Lave and Wenger's perspective, since language is inextricably bound-up with practice, and it is in practice that people learn, language is a powerful mediating resource because it supports acting in the world as much as talking about the world (Lave and Wenger 1991: 85). Hence learning, for them, is spatially

our actions rather than the philosophical tradition of conceiving of social practice in 'normative' terms. This issue will be returned to in Chapter Nine.

[13] Lave and Wenger (1991:97) contrast this notion with a 'teaching curriculum' which is constructed by educators to support instruction.

and temporally distributed among co-participants and mediated by the different perspectives, cultural tools and other members the participating 'community'[14].

Lave and Wenger's claim that participation in expert practice is an epistemological principle of learning suggests a different goal for learning compared with the current preoccupation in higher education with the acquisition of, what post-Dearing, is defined as subject knowledge. Learning in educational institutions, from Lave and Wenger's standpoint, should be conceived of as participation in subject-based communities of practice (Sfard 1998: 6). Thus, it would follow that disciplines should be conceived of as though they were communities of practice and learners provided with opportunities to participate in their expert practices.

Furthermore, the claim that participation in expert practice is an epistemological principle of learning constitutes, in theory, a way of engaging with Knorr Cetina's argument that knowledge societies/economies presuppose the existence of epistemic cultures and epistemic activity. It can be argued that the concepts of communities of practice, legitimate peripheral participation and the learning curriculum provide criteria to identify the way in which epistemic cultures could be created and sustained, and epistemic activity could be fostered in a range of educational settings by enabling learners as participants. This suggestion is less straightforward than it may seem since there are certain difficulties associated with Lave and Wenger's conception of knowledge and learning.

In their attempt to identify a strong explanatory principle for learning that works across settings, Lave and Wenger attempt to eradicate 'folk dichotomies' they feel that dog traditional theories of learning, including Vygotsky's ideas about mediation. However, by viewing theoretical knowledge as just another form of situated practice, Lave and Wenger introduce an incipient relativism into their

[14] This idea of the distributed dimension of mediation is rather underdeveloped in Lave and Wenger's work. It is explored more fully by Hutchins (1995: 297) through his notion of 'meta-mediation'

discussion of knowledge. Consequently, they, like Wertsch, leave us with a series of disconnected knowledges, though in their case the knowledge is encapsulated in the world of practical activity rather than symbolic languages.

This happens for a number of reasons. First, Lave and Wenger, for similar reasons to Wertsch, misinterpret Vygotsky's epistemological position and fail to appreciate that Vygotsky was not only sensitive to the historical constitution of concepts, but also aware that concepts only become meaningful when they 'comprise elements of a system of connections' (Derry 2003: 55). The second reason follows from the first, by viewing theoretical and everyday knowledge as equivalent forms of situated practice Lave and Wenger miss what is distinctive about both types of concepts. They both allow us to maintain a relation to the world; however, the system of knowledge in which theoretical concepts are located provides us with a way of disclosing relations about knowledge and practice that otherwise remain obscured from sensory perception. Thus, our use of theoretical concepts repositions us in relation to knowledge and practice and offers us possibilities for act differently in relation to both of them.

This observation alerts us to the first difficulty with Lave and Wenger's conception of knowledge and learning. In common with Vygotsky, they appreciate the normative basis of knowledge. Their phrase 'learn to talk' like a member of a community of practice acknowledges this dimension and also introduces the idea that our identity and relation to the world changes as we learn to 'talk like' a community member. Where their ideas about knowledge differ from Vygotsky is that they are only concerned with the differences he identified between theoretical and everyday concepts; this leads Lave and Wenger to argue we have to eradicate these folk dichotomies if we are to overcome the gap between us and the world. Their solution is, as we saw earlier, to focus on participation in practice.

that is, the co-ordination of a range cultural tools that often lie beyond the boundary of specific communities in order to be accepted as a member of a community.

In doing so, Lave and Wenger disregard the interdependence Vygotsky demonstrated exists between theoretical and everyday concepts. We never assimilate theoretical concepts in their completed form, according to Vygotsky, because our understanding of them builds on and transforms our current form of thinking (Derry 2003: 96). This implies that the characteristics of our own thought is expressed in our interpretation of and use of theoretical concepts in relation to our everyday concepts; thus the former do not supplant the latter, they simply help us to think in theoretically-informed ways. This idea about conceptual restructuring implies that it is important to identify the pedagogic practices that facilitate the mediation of different types of concepts, rather than to argue that we must eradicate what are perceived as 'folk dichotomies.'

The second difficulty with Lave and Wenger's ideas about knowledge and learning occurs as a result of their focus on stable and well-bounded communities of practice[15]. It leads them to overly restrict the analytical value of their concept of community of practice. They imply that the knowledge gained from participating in practice is not dependent on anything other than the ability to talk like other members of the community and to operate like those members. On the one hand, this plays down the complexity of participating in social practice not least because participation is more multifaceted than they acknowledge (Beach 2003). On the other hand, the knowledge held by specific communities is, from Lave and Wenger's standpoint, totally separate from the knowledge held by other communities as opposed to being potentially mutually informative. They thus preclude the possibility that practice develops as we develop the capabilities to mediate different types of concepts associated with different communities of practice. Yet it is this process of mediation, as we saw in Chapter 4, that characterises the knowledge economy/society and is central to inter-and intra professional activity in such economies and societies.

[15] It has been argued that some researchers have over extended Lave and Wenger's concept and assumed that any community is a community of practice and that we need to re-establish tighter boundaries if we are to benefit from the analytical focus the concept provides (Edwards 2004)

In conclusion, it can be argued that Lave and Wenger's definition of participation in expert practice as an epistemological principle of learning introduces a new pedagogic principle; namely an acknowledgement of the importance of context in learning. In the process, it alerts us to the possibilities for learning offered by existing practice. The principle of participation is not entirely helpful however; it can appear to suggest that we do not need to examine the way in which the content encountered in specific contexts repositions us to see connections which had otherwise escaped our attention (Edwards 2004). Furthermore, it avoids the issue of how and when we should begin to question the 'rules' of practice.

Mediation through existing 'cultural tools'

One of the concerns that has been expressed earlier in the chapter about Wertsch and Lave and Wenger is that their respective attempts to explain how mediated action and situated participation overcome the two worlds of knowledge have eradicated the possibility that theoretical knowledge has any foundations. One of the central arguments of the thesis, however, is that Vygotsky's conception of mediation explains the way in which the foundations of knowledge are built up and allows us to understand the way in which new knowledge and activity are produced. Vygotsky's definition of theoretical concepts and by extension the way theoretical concepts restructure everyday concepts has been subject to critical scrutiny amongst his own followers. For that reason, the next section of the chapter analyses the work of Vassili Davydov[16] who elaborated Vygotsky's (1987: 100) definition of theoretical concepts his ideas about pedagogy.

Davydov felt Vygotsky had made an enormous breakthrough with his distinction between theoretical and everyday concepts, in comparison with

16 It is beyond the scope of this thesis to address the evolution of Davydov's ideas, which drew on Vygotsky and ideas from other Russian Activity Theorists as well as from European and North American Developmental Psychology. Readers interested in pursuing this matter should consult Davydov's (1990) own work since, at present, no one has produced a commentary on his work.

previous ideas about concept formation in psychology. Nevertheless Davydov argued that Vygotsky had not really defined what was distinctive about theoretical concepts. He pointed out that Vygotsky defined theoretical concepts in accordance with the following characteristics. They were: (i) a part of a conceptual system and not 'free-standing' notions; (ii) acquired through learners consciously engaging with their history and purpose as well as the relationships between theoretical concepts; and (iii) acquired through instruction and not casually by assimilation.

There were, according to Davydov, a number of difficulties with this conception of theoretical concepts. The first difficulty was Vygotsky did not define theoretical concepts in terms of 'their objective content, but in the method and way of mastery ('personal experience', the process of instruction')' (Davydov 1990:189). Consequently, it was conceivable that other types of concepts such as 'empirical' concepts might, according to Davydov (1990: 189), appear to be based on a similar form of classificatory system that Vygotsky maintained were a characteristic of theoretical concepts. By 'empirical' he meant concepts associated with the positivist tradition in natural science that are assumed to emerge from a series of generalisations arising from empirical data. Davydov wanted to ensure that an empirical approach to concept formation was not viewed as offering the same insights that a dialectical approach offered. The second difficulty was that Vygotsky overlooked that empirical concepts are usually taught systematically in school, normally in school subjects on the basis of conceptions of issues based on 'similarity' or 'dissimilarity' from one another (Davydov 1990: 245-53). The key difference between the teaching of a theoretical and an empirical concept is in terms of the '*particular* system' in which the former is taught. To teach theoretical concepts, according to Davydov (1990: 255), it is important to:

'bring *together* things that are *dissimilar, different, multifaceted,* and *not coincident,* and should indicate their proportion in this whole'.

The third difficulty was Vygotsky's emphasis on the systematic description of the content of theoretical concepts during instruction did not constitute adequate criteria for defining how we learn theoretical concepts. The problem, as Davydov (1972: 162-63) remarks, was that defining acquisition as beginning with:

'the 'general' verbal definition by no means characterises the scientific nature of a concept; also arbitrary everyday notions, empirical general notions can be transmitted this way in instruction'.

Hence Davydov (1990: 249) redefined theoretical concepts arguing that they[17]:

'function as a form of mental activity by means of which an idealised object and the system of its interconnections, which reflect their unity in the generality or essence of movement of the material object, are reproduced'. [and as] 'a form for reflecting the material object and as a means of mentally reproducing, constructing it - that is, as a particular mental action (Davydov 1992:249) [and, they thus constituted] a reality of objectively interconnected phenomena, which make up an integral system (Davydov 1990:254)'.

By this he meant that any changes or connections identified within a field of knowledge had to be treated as features of a broader series of interactions, rather than discrete and separate events or incidents. Furthermore, Davydov also argued that whereas pedagogies based on what he refers to as empiricist epistemologies assume theoretical relationships are observable through the senses, the type of pedagogy he was proposing did not accept this proposition. From Davydov's (1990: 225) perspective, theoretical relationships 'are not given in available, established, resultative, and dissociated being. The internal (relationship) is detected in mediations, in a system, with a whole'.

[17] There is an extensive literature on concept formation in other branches of psychology see, for example Piaget (1970), Nelson (1995) von Glasserfield (1987). I only concentrate upon the debate in Activity Theory because it takes forward Vygotsky's (1987) original critique of the inductivist tradition of concept formation and attempts to define what is distinctive about the theoretical tradition of concept formation.

One of Davydov's primary concerns was to go beyond the empirical conception of curriculum and pedagogy, which he felt continued to perpetuate the two worlds of knowledge in educational systems in Russia. Hedegaard and Chaiklin (1990: 153-4) have argued that they also perpetuate it in educational systems in most advanced industrial societies[18]. The hallmark of the empirical conception of curriculum and pedagogy is, according to Hedegaard (2001: 33), to assume the existence of decontextualised knowledge of the natural and social world and that it is best taught by being broken down into discrete pieces of information.

To assist learners to formulate a theoretical relationship with the world, Davydov (1988:22-3) developed a new pedagogy which incorporated the idea of experimentation. In contrast to Dewey, Davydov meant an opportunity to discover the conditions of the origination of a concept in relation to the field in which it was located. This pedagogy is referred to by Davydov (1988. Pt 2. P 23) as 'developmental teaching' because the intention is to facilitate the development of theoretical thinking and theoretical consciousness that would enable us to deduce 'more particular relationships from general underlying relationships'.

To clarify the difference between the approach he was promoting to the relation between theory and concepts and an empirical approach, Davydov distinguishes between, what following Ilyenkov[19], he refers to as, a 'kernel concept' and the interconnections of the object under study. For Davydov, theoretical concepts:

'function as a completely specified and concrete *means of connecting* the general and the specific, a *means of deducing* particular and specific phenomenon from their general basis. Due to this, *the development* of an object functions as the content of the theoretical concept'.

Davydov (1997: 305)

[18] There are considerable parallels between Davydov's approach and that of Gal'perin (1989) because many of the starting points in Davydov's theories reflect the influence of Gal'perin who was his mentor while he was completing his university studies. I have chosen to focus on Davydov because of his link to Vygotsky and Engeström who is discussed later in this chapter.

[19] A fuller discussion of the relevance of Ilyenkov's work in relation to the concept of mediation is provided in Chapter 8.

The hallmark of a theoretical concept is, therefore, a substantive generalisation, which explains the transition from the general to the particular (or the ascent from the abstract to the concrete) and identifies the conditions and conceivably the means to facilitate such a transformation. The 'mechanism' for ascent, according to Davydov (1990: 291), is the disclosure of contradictions between aspects of a relationship that is established in an initial abstraction, then in a more concrete one'[20].

The core of theoretical thinking for Davydov (1988: 22) involves learning how to formulate theoretical generalisations. He maintained that we can develop this form of thinking, if we are supported, to analyse and identify a 'primary general relationship' in a specific field of study, and, in the process, to disclose the 'rule-governed links' that exist between this primary relationship and its 'diverse manifestations' (Davydov 1990: 293). To accomplish this objective, Davydov (1988: 30)[21] identified a sequence of six learning actions. They are to:

- transform the conditions of the task in order to reveal the universal relationship of the object under study;
- model the identified relationship in an item-specific, graphic, or literal form;
- transform the model of the relationship in order to study its properties in their 'pure guise';
- construct a system of particular tasks that are resolved by a general mode;
- monitor the performance of the preceding actions;
- evaluate the assimilation of the general mode that results from resolving the given learning task.

20 This stands in stark contrast to an empiricist conception of the relation between theory and practice. The empirical method implies that knowledge of the object under investigation can be acquired through sensory contemplation of that object. Echoing Vygotsky's critique of Piaget's explanation of concept formation discussed in Chapter 6, Davydov (1990: 275) argues the empirical approach is unable to establish the nature of connections between concepts (an example is volume and density). This is the reason why empirical inquiry cannot disclose the kernel concept, that is, the generalisation that lies at the heart of the interconnections.

A number of assumptions informed the construction of this sequence. The first assumption is that if we are to understand the purpose of a theoretical concept, we have to ascertain the conditions of its origination, that is, the historical and cultural reasons responsible for its development (Davydov 1988: 23). The second assumption is that if we are to use theoretical concepts as explanatory tools, we should try to identify any contradictions in those concepts and form a tentative sense of how the contradictions might be resolved (Davydov 1990: 293). The third assumption is that if we are to think in theoretically-informed ways, we should try to identify the connection of a particular concept to other manifestations of it in the field being studied. For example, to identify and isolate a kernel concept such as mediation by modeling and examining the concept in relation to its diverse particular developmental forms and manifestations. The cyclical structure of the learning actions he had devised, according to Davydov (1988: 19-24), facilitated the establishment of these links.

The learning actions constitute, therefore, an attempt to operationalise the principle of ascending from the abstract to the concrete. As Davydov observes:

> 'To make such a generalization means to discover a principle, a necessary *connection* of the individual phenomena within a certain whole, the law of the formation of that whole. Disclosure of the general nature of some real relationship occurs ... in the process of *analyzing* those of its features that allow it to be the genetic base of a developed system'.
>
> Davydov (1990: 295)

Stated another way, as we develop generalisations that discloses the essence of the object or phenomena under study, we are able to use these generalisations as a guiding principle to mediate our understanding of other theoretical concepts and to suggest the practical ways in which such concepts might be used.

[21] Davydov identified these six 'learning actions' over the course of some thirty years of experimental research on the developmental method.

In the context of the argument this of thesis, Davydov, unlike Wertsch and Lave and Wenger, affirms that it is important to identify conceptual content of learning as well as the pedagogic process that facilitate our capability to think in theoretically-informed ways. Following Vygotsky, this would presuppose designing the curriculum and pedagogy so that we are provide with opportunities to mediate what Chapter 6 referred to as the latitude and longitude of concepts. That is, to mediate theoretical concepts 'vertically', to establish connections with other concepts, and to mediate them 'horizontally', to establish connections with everyday concepts.

Davydov's own research concentrated primarily on the first of these modes of mediation. The strong teleological assumptions that inform his cycle of learning actions, however, predispose Davydov to gloss over a number of issues about learning concepts. The first issue is that he assumes that we assimilate theoretical concepts in the complete form in which they are taught to us. This implies that the full meaning of a theoretical concept is built up gradually rather than an automatic outcome of mediation. The second issue is that Davydov takes for granted that the opportunities for mediation built into the cycle of learning actions will facilitate the modes of thought and action he anticipates. He assumes, on the one hand, that the opportunity to understand concepts' conditions of origination will automatically result in us grasping the meaning of a concept. On the other hand, the opportunity to use kernel concepts to resolve specific disciplinary problems will guarantee that we will develop the capability to think in theoretically informed ways.

One of the difficulties with this pedagogic approach is that it plays down the complexity of the process of conceptual restructuring which Vygotsky identified. First, our existing everyday concepts are not some form of naturalistic or anthropologically invariant knowledge; they have been shaped, as Vygotsky revealed, through the way in which we use theoretical concepts to mediate everyday concepts. Thus, everyday concepts are not automatically replaced when we learn a new concept; their own history and logical structure influences the way

in which we respond to theoretical concepts. Second, our ability to appreciate the relevance of a theoretical concept is likely to be influenced by the extent to which we can use it to mediate vertically and horizontally.

The above observations suggest that instead of viewing the purpose of Davydov's cycle of learning actions in teleological terms, it may be more helpful to view its pedagogic purpose as supporting us to engage in the 'social practice of reasoning with concepts' (Brandom 2000: 45). This suggestion is consistent with Vygotsky's argument about the interdependence between everyday and theoretical concepts. For Vygotsky, the purpose of introducing us to theoretical concepts was to assist us in using those concepts to rethink our relation with the natural and social world. Moreover, he appreciated this process was not an automatic outcome of learning a theoretical concept in educational settings. Amongst other matters, it is influenced by our ability to invoke reasons to explain why we would want to call on one theoretical concept rather than another when analysing a situation. Vygotsky's ideas about vertical and horizontal mediation remained, as we saw in Chapter 6, rather underdeveloped in his own writing. For that reason, the link between these different forms of mediation, Davydov's cycle of learning actions and the social practice of reasoning will be returned to later in the thesis.

One of the challenges of the knowledge economy, however, is that we not only need to be able to mediate between theoretical and everyday concepts, we also need to produce new concepts to help us to change social practice. This observation provides a link to the discussion of the work of Yrjö Engeström.

Mediation as 'concept formation'

Of all the post-Vygotskians discussed in this thesis, Yrjö Engeström (1987) has made a determined attempt to relate his work to the Vygotksian corpus, and to the manifestations of economic, social and political change we increasingly face in advanced industrial societies. In the case of the former, he has attempted to

demonstrate how his theory of 'expansive learning' and his ideas about concept formation are an extension and elaboration of Vygotsky's and Leont'ev's ideas about mediation (Engeström 1987; 2001). In the case of the latter, he has explicitly linked the formulation of his theory of 'expansive learning' to the challenges we face to change activity in advanced industrial societiess. Engeström (1987: ch. 1. p.1.) felt that existing psychological theories of learning, cognitivism and constructivism[22] had little to offer in this regard because they were essentially 'reactive forms of learning'. Their roots in formal education meant that they presupposed a given context and a pre-set learning task; as such, they were predicated on a view of learning that assumes we 'cope with tasks *given* to us'. What was required, according to Engeström (1987), was a theory of learning that allows us to rethink the purpose of activity, to produce new concepts to envisage new forms of activity, and then to implement those new forms of activity.

To appreciate Engeström's theory of expansive learning and how it facilitates the formation of new concepts and new activity, it is necessary to understand the relation between the two new concepts 'activity system' and 'cycle of expanded learning' he formulated. It is nevertheless beyond the scope of this thesis to discuss Engeström's formulation of his concepts. Since my main concern is to analyse his idea of mediation as concept formation and changes in activity systems, I have summarised his main assumptions[23].

The concept of an activity system is best thought of as a 'theoretical lens' (Russell 2001) that represents[24] 'the smallest and most simple unit that still preserves the essential unity and integrated quality behind any human activity (Engeström 1987:

[22] By cognitivism, I mean the school of psychology influenced by, amongst others, Simon (1978) who employ computational models to study the operation of the human mind. In contrast, constructivism refers to a more disparate field of psychology which assumes that individuals construct meaning through active engagement with the world, see von Glaserfeld (1987).

[23] An account of how Engeström devised his concept of an 'activity system' and his theory of 'expanded learning' is found in *Learning by Expanding: an activity-theoretical approach to developmental research* (Engeström 1987).

[24] His notion of an activity system applies equally to different types of institutions, education or work, as much as different examples of those institutions, such as schools, factories or hospitals.

ch. 2, p. 27). The main conclusions that his concept of an activity system rests on can be summarised as follows.

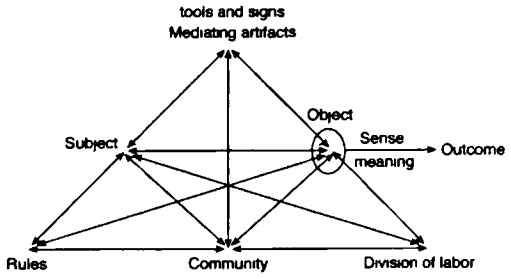
- we have a mediated relationship with the society we are a member of and that relationship can be understood as an 'integral system' of different activities characterised by 'internal dynamic transitions';
- to understand the qualitative transitions societies undergo it is necessary to adopt a historical perspective;
- the structure of activity found in primitive as well as advanced societies can be characterised in terms of the following four categories: production, distribution, exchange (or communication) and consumption;
- contradictions constitute the impetus for change in activity systems.

Engeström's concept of an activity system is an attempt to reformulate Vygotsky's mediational triangle by incorporating: (i) Leontiev's concern for the object of activity; (ii) Leontiev's concern for the institutional context of mediation; and (iii) his own conclusions about human activity. He accomplishes this reformulation by locating the initial triangle:

> 'in an enlarged context so that we see a triangle, but now it is a set of interconnected triangles.....the triangles do not exist in isolation from one another; rather they are constantly being constructed, renewed, and transformed as outcome and cause of life'.
>
> Cole (1996: 141)

His model for the actual structure of an activity system depicts, according to Engeström, the purpose of activity (i.e. the object), the context of activity (i.e. rules, community and division of labour) and the cultural tools (i.e. mediating artefacts) used to sustain or to transform activity. The top of the figure represents the form of mediated action through which we (i.e. the subject) initially reconsider the purpose (i.e. the object) of activity and subsequently transform the purpose of and the structure of activity in the process of acting upon it. The top triangle is

Figure 7. 1. The Structure of an Activity System



source Engeström 1999

located in relation to the components of collective activity - 'community', 'rules' and 'division of labour' identified at the bottom of the triangle. They represent respectively: individuals and social groups who share the same object as one another; norms and sanctions that specify and regulate procedures and interactions amongst individuals and groups; and the distribution of tasks, powers and responsibilities among individuals and groups. The 'multivoiced' character of those relationships, that is, their different histories, cultural traditions and so forth, and the sense of ambiguity, surprise and potential for change is represented through the use of an oval in the model, suggesting the, as yet, unknown outcome of the object of activity (Daniels 2000)[25]. Thus, his concept of an activity system is 'an inherently dynamic structure, continuously undergoing change in its parts, in its relations, and as a whole' (Roth 2004:4).

Having conceptualised activity in general (i.e. education, work) as an 'activity system', Engeström formulated a theory of learning - 'expansive learning' to assist us in overcoming the contradictions we encounter in activity systems[26]. His theory

[25] Thus, in formulating the concept of an activity system, Engeström contributed to further transformation of the concept of activity that Leont'ev inaugurated from its origins in Russian philosophy and psychology as a concept to explain the development of consciousness, to its current status as a fully-fledged theory about human development (Bakhurst forthcoming).

[26] Engeström (1987) draws upon a diverse range of social and human science traditions in an attempt to explain the genesis of his concept 'learning by expanding'. Based on Engeström's use of citations, I have

is based on three premises. The first premise is that the origins of human learning in primitive societies and in early childhood lie in a form of 'learning operations' and 'learning actions' other than those taught in formal education. These operations and actions allowed us to see that the object of our activity was more complex than it might originally have seemed to be. Thus, it follows for Engeström (1987: ch.1, p.10) that we do not have to rely on educational institutions to provide us with the cultural tools to transform activity systems not least because most theories of learning were never formulated to support us to transform human activity. Learning to see the object of activity in more complex ways requires us, according to Engeström (1987: ch1, p.10), to identify the 'initial abstraction the germ-cell [kernel concept] category' that we can use to identify contradictions in activity systems. He defines this concept as 'learning by expanding'.

The second premise arises from Engeström's own argument that contradictions are the impetus for change in any activity. He argues that we require a special mechanism - the 'mechanism of transition from learning to expansion' to help us to expand the object of activity by identifying contradictions in activity systems and to envisage solutions to them (Engeström 1987: ch.1, p.10.). Furthermore, the identification of contradictions presupposes, according to Engeström, which we can overcome the constraints the division of labour, rules and community generate and sustain within activity systems. Hence, he defines the third premise as the establishment of the 'central instruments' needed for the mastery of expansive transitions' (Engeström 1987: ch.1. p.10). The main purpose of such instruments is, according to Engeström (1987: ch.3, p. 3), to help us to overcome the 'double binds' (Bateson 1973:242), that is, the self-defeating habits that trap us from transforming activity. Building on Leont'ev's insight that we require a special act of reflection to scrutinise critically existing activity, Engeström, cites Wartofsky (1973: 204), and argues that this goal is more likely to occur when we have a 'space' where the normal rules and conventions of activity are waived.

selected what I consider to be the main intellectual influences upon the development of the theory of 'expanded learning'.

Using Davydov's cycle of learning action as his starting point, Engeström (1987: ch. 5) reformulates the cycle to create a new cultural tool - the 'cycle of expansive learning' (CEL). Unlike Davydov's cycle, which was a pedagogic strategy designed to assist us to understand and grasp their relation between existing theoretical concepts, the CEL serves methodological and pedagogic purposes. It is designed to foster the mode of theoretical thinking necessary to identify contradictions in activity systems and to assist us in formulating new concepts to overcome those contradictions.

The expansive learning cycle

- *questioning*, criticising or rejecting some aspects of accepted practice and existing wisdom;
- *analysing* the situation, involving mental, discursive or practical transformation of the situation in order to find out causes or explanatory mechanisms;
- *modelling* the newly-found explanatory relationship in some publicly observable and transmittable medium;
- *examining* the model, running, operating and experimenting on it in order to fully grasp its dynamics, potentials and limitations;
- *implementing* the model, by means of practical applications, enrichments, and conceptual extensions
- *reflecting* on and evaluating the process;
- *consolidating* its outcomes into a new stable form of practice.

after Engeström (2004)

Thus, CEL is, for Engeström (1987: ch.4.), radically different from other pedagogic approaches because it has been designed to facilitate learning in any context, for example, education or work, when the object of activity is to transform aspects of that context and not to learn the content of different subjects. The first step - questioning - encourages us to engage with the situated basis of our activity by identifying contradictions effecting performance and outcomes. The next two steps - analysing and modeling involves the formulation of and modeling of a new kernel concept that represents a way of moving beyond the constraints of the

existing practice. While the next two steps – examining and implementing involve the kernel concept being step-by-step enriched and transformed into a concrete system of multiple, constantly developing manifestations' (Engeström 2004: 230).

This process of working through the CEL to develop a future vision of activity based on the new kernel takes place in a 'boundary crossing laboratory' which is established inside an activity system (Tuomi-Grönin and Engeström (2003: 31)[27]. This laboratory, where researchers work alongside participants, provides a space where participants can depict 'expansive solutions' to the contradictions they identify in activity systems without being inhibited by the constraints of existing double binds. Expansion happens in two ways:

> 'substantively by [participants: DG] constructing a more encompassing object and motive for the activity, and socially, by recruiting a growing number of participants in the transformation effort'.
>
> Tuomi-Grönin and Engeström (2003: 31)

The cumulative effect is the implementation, consolidation and proliferation of the new form of practice of the system.

The expansive formation of concepts is not only different from Vygotsky's original work on concept formation, it is also constitutes a very different solution to overcoming the two worlds of knowledge compared with the approach Vygotsky advocated. Vygotsky presented the process of concept formation, according to Engestrom *et al.* (forthcoming), as a 'creative meeting' between everyday concepts growing vertically upwards and theoretical concepts growing downwards in the zone of proximal development. In contrast, Engeström introduces an entirely new approach to concept formation and hence to theoretical thinking based on the

[27] The concept of the 'boundary crossing' laboratory is an attempt to go beyond Lewin (1984) and Senge's (1990) attempts to use a laboratory approach to facilitate organisational change and development (Engeström *et al.* 1996: 13). According to Engestrröm, the defining difference between the respective approaches is that Lewin and Senge were primarily concerned with analysing 'practice from a distance' (i.e. speculation about the implications of change) whereas his approach is embedded in the practice of the activity system in an attempt to change that practice.

philosophical anthropology of Arsen'ev *et al.* (1967 (1967:14)[28]. They claim that theoretical concepts arise out of the interplay of two forces that shape different types of activity (i.e. education, work); these forces are the:

'continuous construction of the anticipated future object (outcome) of the activity through active material and mental *experimentation,* and the equally continuous sensuous or contemplative experiencing and *observation* of the object 'as it is'

Engeström (1987: ch.4, p.21)

Theoretical concepts, in other words, never merely reproduce events as we experience them, such concepts possess from the beginning the possibility that they can be used to create something that has not yet been observed or experienced.

It is possible to develop theoretical concepts in any type of activity, according to Arsen'ev, Bibler and Kedrov (1967: 14), because the interplay of the forces of experimentation and observation are not just characteristic of discipline-based theoretical thought; they apply equally to everyday thought. Thus, it follows from this standpoint, that it is possible to develop a new type of theoretical concept from everyday activity and, moreover, that the methodology and pedagogy used to formulate this concept provides a way to overcome the two worlds of knowledge. Building on these assumptions, Engeström maintains that it is possible to use the CEL to produce new types of theoretical concepts (Engeström 2001; 2004). These concepts evolve historically and situationally as members of activity systems use the CEL to trace the relation between the initial kernel concept which they have formulated (i.e. the 'declared concept') to overcome an agreed contradictions in an activity system in relation to the reality of applying that idea (i.e. the 'experienced concept') (Engeström *et al.* forthcoming). The outcome of this process is, for example, the formation of a new concept such as his concept of the 'care

[28] My interpretation of Arsen'ev *et al.* has had to rely on Engeström's own exposition of their ideas since their work has not been translated into English.

agreement' (Engeström 2001). This concept has grown gradually out of doctors, nurses and patients having initially used the CEL to identify contradictions in existing patterns of health care and subsequently teasing out how to offer a more holistic and patient-centred service.

This new type of theoretical concept is defined by (Engeström 2004: 230) as 'theoretically grasped practice'. By this he means, the new kernel concept consists of the features originally worked up during the application of the first three stages of the cycle, mediated by the features that emerge during the final stages of the cycle. Because the new concept has arisen through an interrogation of practice, it constitutes, according to (Engeström 2004: 233), a 'new instrumentality'; that is, a tool individuals and groups can use to expand the object of work. Thus, it can be argued that, even though Engeström has not explicitly articulated his intentions in formulating his concept of the CEL as a strategy to overcome the two worlds of knowledge, they are, in effect, cultural tools which we can use to accomplish that objective.

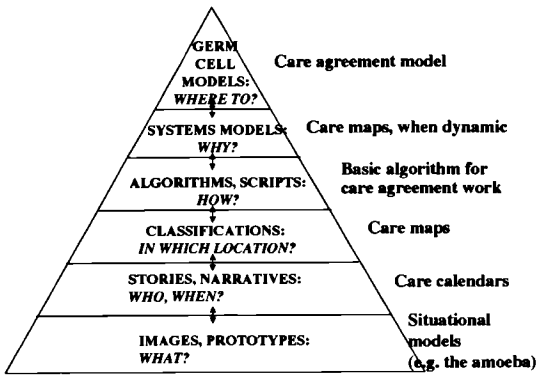
This approach to concept formation means that the application of the CEL predisposes members of an activity system to operate within a radically different idea of the zone of proximal development from Vygotsky's original formulation of the concept and its application in educational contexts. The new zone:

> 'reflects he distance between their everyday activities and the historically new form of social activity that can be collectively generated as a solution to the double bind potentially embedded in the everyday actions'
>
> Engeström (1987: ch. 1. p. 17)

Working in this expanded zone, members of an activity system use the new kernel concept, for example, the 'care agreement', to 'fill gaps' between the 'situational *what*' conceptualisations and 'historical-visionary *where to*' conceptualizations (Engeström *et al.* forthcoming). By this Engeström means that doctors, nurses and

patients continue to develop the concept on the basis of their experience of applying it to change the division of labour and so forth in an activity system.

Figure 7.2. Dynamic hierarchy of conceptualizations in the care agreement case



source Engeström *et al.* (forthcoming0

This results in what he refers to as new 'intermediate concepts' care calendars, care maps, a basic algorithm for care agreement work, and care maps with dynamic interconnections - being created to reflect the new pattern of working that the care agreement had ushered in. Figure 7.2. represents the new relationship between the intermediate concepts and the care agreement.

Engeström's theory of expansive learning, and his concepts of an activity system and the CEL are relevant to the concerns of this thesis in a number of ways. In the case of the former, it introduces a new pedagogic principal - 'expansion' that offers a different approach compared to Lave and Wenger's ideas about participation to go beyond the two worlds of knowledge. His principle emphasises that in order to change an activity system it is necessary to positioning ourselves to see the object of activity in a more encompassing way (Edwards 2004).

This idea that we can go beyond the two worlds of knowledge by expanding the object of activity through concept formation is very helpful in the context of the

knowledge economy in a number of ways. First, it reminds us that in order to change the object of activity we need to promote systemic learning in activity systems through, for example, enabling members of those systems to produce new concepts to change the rules, community and divisions of labour that shape the existing activity system. The idea of expansion provides then, in theory, an alternative way to overcome the two worlds of knowledge compared to the emphasis in Vygotsky's work, as we saw in Chapter 6, on the vertical and horizontal mediation of theoretical and everyday concepts. Engeström's emphasis on 'theoretically-grasped practice' reminds us that Vygotsky's interest in the role of cultural development led him to concentrate on the relation between existing theoretical and everyday concepts. As a consequence, Vygotsky only considered how new concepts were produced within disciplinary frameworks he did not explore the possibility that other types of concepts may be required to facilitate change in social practice. Yet, in the context of the knowledge economy, the production of new concepts is, as we saw in Chapter 4, central to economic development. Second, the principle of focusing on the motive of a specific activity in relation to the motive of a wider activity of which it is a part which informs the application of the CEL offers a way to go beyond the limitations of the 'pedagogies of reflection'. They were primarily concerned with learners' trajectories, for example, critically appraising conceptions of knowledge or translating different discourses into one another. His ideas provide a way to foster inter- and intra-professional learning (Daniels and Edwards forthcoming).

Engeström maintains that his theory of learning and concept formation is not effected by the legacy of dualistic thinking. These claims, however, are based on a number of epistemological and pedagogic assumptions that have theoretical consequences for his argument about mediation through concept formation.

The first issue is that theoretical concepts were, for Vygotsky, characterised by their capacity for 'generalisation' and 'unification'. By this he meant that they were a part of a wider system of knowledge, they were characterised by their own

distinctive content, they could serve as an explanatory principle for change and development within a given field of study, and they were internally and externally connected to other concepts. Put simply, it was possible to discern the way in which concepts were related to one another in the same field and the way in which different fields were differentiated from one another. Engeström claims that the theoretically-grasped practice constitutes a kernel concept because it has a capacity for generalisation. However, he does not discuss the other criteria which Vygotsky maintained characterised theoretical concepts; namely that the criteria are not separate, it is their dialectical relation that is responsible for the creation of theoretical knowledge. This, in effect, renders theoretically-grasped practice as a free-standing concept, in other words, lacking any connections to other concepts. We are left, therefore, with the problem of how to use the new concept to engage in, what Brandom (2000: 45) refers to as, the 'social practice of reasoning'; that is, the practices that allow us to infer what follows from using that new concept.

The second issue is that the link between concept formation and change in activity systems is more complex than Engeström acknowledges. The basic postulate of his approach is that the CEL constitutes a sufficient pedagogic strategy to help us to identify contradictions in activity systems and to change those systems. This plays down the extent to which we may require access to theoretical concepts which are external to the immediate situation to disclose aspects of the world we have taken for granted if we are to analyse the context in which an activity system is operating (Lahn forthcoming). The final issue is that by maintaining that the CEL is most productively applied in the boundary-crossing laboratories he establishes in workplaces as part of his 'Developmental Work Research Programme', Engeström effectively limits it to the research process. Given that one of the challenge of the knowledge economy-society is, as Knorr Cetina has argued, to foster an 'epistementality' towards knowledge production, it is important to consider the potential role of the CEL in achieving that objective.

Conclusion

This chapter has examined the work of a number of post-Vygotskians who have elaborated different aspects of mediation that were under-developed in Vygotsky's original formulation. Principally, it has shown the way in which the post-Vygotskians have broadened our understanding of: (i) the relation between the object of activity and the context of mediation; (ii) the discursive and situated basis of mediation; (iii) the way in which different types of cultural tools generated different mediated outcomes.

The chapter has acknowledged that the different philosophical assumptions that inform the extension and elaboration of mediation have generated some points of tension between Vygotsky and the post-Vygotskians. It noted that although Vygotsky and the post-Vygotskians were committed to developing a non-dualistic theory of the relation between individuals and the world, they maintained very different epistemological positions as regards the contribution that theoretical concepts make in realising that goal. Where Vygotsky emphasised the interdependence between theoretical and everyday concepts, Lave and Wenger and Wertsch argued that the distinction between theoretical concepts and everyday concepts represented an implicit dualism in Vygotsky's thinking. In contrsast, Engeström advocated the production of a new type of theoretical concept theoretically-grasped practice as a way to overcome the dualism while Davydov felt that it could only be overcome if we thought in theoretically-informed ways.

From the standpoint of the thesis, what emerged from the post-Vygotksian elaboration and extension of mediation were two new pedagogic principles - 'participation' and 'expansion, that drew attention to aspects of the process of learning that Vygotsky had not addressed. The former has been widely commented on as the polar opposite of the traditional purpose of learning to 'acquire' concepts in recent discussions in learning theory (Anderson *et al.* 1996;

Sfard 1998) while the latter has primarily been discussed as an alternative to the notion of participation (Edwards 2004).

The thesis, however, maintains in that the above three pedagogic principles are more interdependent than either their authors acknowledge or than the discussions about them have appreciated. Before considering the implications of this claim, it is necessary to resolve the epistemological tensions that surfaced between Vygotsky and the post-Vygotskians. For this reason, the next chapter turns to a number of writers who are gradually being credited with having developed philosophical positions that allow us to reappraise the consequences of our activity in the world and hence the relationship between theoretical and everyday concepts.

Chapter 7

Beyond the two-worlds of knowledge (2): The contribution of the post-Vygotskians

Introduction

This chapter has two main aims: to analyse the way in which Vygotsky's concept of mediation has been developed and elaborated by a number of post-Vygotskians; and to identify the way in which these developments are relevant to the concerns of this thesis. The chapter addresses the first aim by focusing on a number of writers - Davydov, Engeström, Lave and Wenger, Leont'ev and Wertsch who are widely acknowledged in CHAT for having made significant contributions in developing the concept of mediation. The chapter identifies the concerns that led them to develop the concept of mediation and clarifies the way in which they have broadened the concept.

The chapter notes that the theorists discussed tend, in the main, to address the implications of their insights to the development of the post-Vygotskian theoretical and empirical corpus. In the process, the theorists raise a number of pedagogic issues that are relevant to any reformulation of the concept of mediation. Nevertheless, in raising these pedagogic issues, a number of the post-Vygotskians misrepresent Vygotsky's epistemological position about the relationship between activity and knowledge and, in doing so, reject Vygotsky's insight about the mediation of theoretical and everyday concept. The chapter argues that Vygotksy's original insight about conceptual mediation has to be retained along with the new insights about mediation provided by the post-Vygotksians if we are to formulate a pedagogic strategy that goes beyond the two worlds of knowledge.

Chapter 8

Beyond the two worlds of knowledge (3): Epistemological considerations

Introduction

Up to now, the following inter-connected argument has been made. First, there are new issues about the role of knowledge in the economies of advanced industrial societies, which are being addressed in terms of a specific conception of knowledge in the sociological, management and educational literature. This view conceptualises knowledge as though there were two separate worlds of knowledge: a subjective form of knowledge emanating from our experience of the world and objective knowledge of the natural and material world, based on the application of scientific realist methodologies. It has been argued that this is an inadequate conceptualisation because the knowledge economy is making the interdependence between these two forms of knowledge much more explicit.

Second, policymakers in the UK (and in most advanced industrial countries) have responded to the idea that knowledge is an economic input by formulating policies to enhance the 'instrumental' purpose of teaching and research in higher education. In the case of teaching, this has resulted in the introduction of modular curriculum frameworks that tend to treat knowledge as information, and the introduction of 'pedagogies of reflection' to support learners in relating such knowledge to the external world.

These developments perpetuate the continuation of the two worlds of knowledge and, as such, are an inadequate response when addressing the challenges posed by the knowledge economy. Those challenges are: the creation of knowledge cultures in education and in the economy that foster an *epistementality* towards knowledge;

and the development of pedagogic practices that assist individuals to overcome rather than perpetuate the separation of different forms of knowledge. It has been argued that Vygotsky's concept of mediation constitutes the basis for going beyond the two worlds of knowledge because it offers a way to conceptualise the relation between mind, activity and world.

The focus of this chapter is to address the tension points as regards theoretical and everyday concepts generated by the post-Vygotskians elaboration and extension of the concept of mediation. The chapter approaches this task through a discussion of the work of Evald Ilyenkov and John McDowell. The former writer has been widely credited with having elaborated and extended some of the presuppositions upon which Vygotsky's original insights about mediation, which were derived in part from Hegel, were based (Derry 2003). While the latter writer is widely celebrated for reconceptualising the Cartesian problem of the separation of mind and world in analytical philosophy by building upon the European philosophical tradition, principally the lineage from Kant to Hegel (Smart 2002). Hence, despite their historical and intellectual separation, Ilyenkov and McDowell's work establishes a philosophical basis for a new conception of epistemology to overcome the two-worlds of knowledge.

This chapter argues that Ilyenkov's (1977a) concept of 'ideality' alters profoundly the normal understanding in the social and human sciences as well as the understanding of many of the post-Vygotskians discussed in Chapter Seven of the relation between mind, activity and the world. The concept of ideality allows us to appreciate the way in which concepts are embedded in the world as part of social practice[1]. This idea is initially explored through reference to McDowell's notion of the 'unboundedness of the conceptual' and further elaborated through reference to McDowell's (1994) interpretation of Sellar's concept of the 'space of reasons'. The

[1] Ilyenkov's concept of Ideality has been discussed in Activity Theory (Bakhurst 1995, Cole 1996; Daniels 2001; Engestrom 1987), however, the main focus of discussion has fallen upon its implications for the distinction between symbolic and material tools, rather than for the concept of mediation.

chapter makes the following argument: the conditions that make knowledge possible lie outside us in the world and these conditions are at the same time social creations. It claims that once their distinctive nature has been grasped it is possible to understand why the distinctions between theoretical and everyday concepts are helpful in going beyond the two worlds of knowledge . The chapter concludes by identifying a number of new pedagogic challenges that follow from using Ilyenkov and McDowell's ideas to make Vygotsky's epistemology explicit,

Mediation, culture and activity

The concepts of 'Ideality' and 'Space of Reasons'

The concept of mediation and its symbolic representation in the mediational triangle constituted for Vygotsky and the post-Vygotskians, as we have seen in Chapter 6 and 7, a way to conceptualise the relation between mind and the world. One of the merits of the concept is that it helps us to appreciate that we do not stand in relation to:

> 'a brute, physical world, but to an *interpreted* environment, an environment conceived of as being *of a certain kind*. This being so, our behaviour can never be simply 'called forth' by the world itself. Rather we act in the light of some reading of reality, a reading that renders our behaviour an appropriate response to the perceived situation. On this view, our actions are more like conclusions to arguments than effects of physical causes'.
>
> Bakhurst (1990: 201)

The idea that we live in an interpreted environment, when located in relation to Ilyenkov's concept of 'ideality'[2], offers us a way to overcome the two worlds of

[2] It might be argued that my presentation of Ilyenkov's philosophical position has eviscerated its avowedly Marxist orientation and intentions. My intention is however is two-fold: to highlight the continuing relevance of the Hegalian tradition that influenced Ilyenkov in relation to my analysis of the

knowledge as well as the dualism the post-Vygotskians opened up between semiotic mediation or mediation through activity.

Like Vygotsky, Ilyenkov was concerned with how the world comes to be endowed with significance, and how the pattern of human behaviour is shaped by the meaning we develop through our interaction with the world. Instead of continuing the longstanding philosophical tradition of accepting the separation of mind and world or the tradition in parts of activity theory to view semiotic and practical activity as separate from one another, Ilyenkov introduced a rather more complex notion about the relationship between mind, world and cultural tools.

Conceived at its broadest, his solution to this problem was to 'try and explain the nature and possibility of ideal (that is, non-material) phenomena (for example values, reasons, psychological processes and states) in the material world' (Bakhurst 1997: 34). By arguing that we humanise the physical world through inscribing significance and value into the objects of the environment and, ultimately, into the environment itself, Ilyenkov (1977a) argues there is not a gap between mind and world. Instead he portrays the world we encounter in experience as an 'idealised' world because we have already humanised it. In this way, Ilyenkov went a step further than Vygotsky because he extended his concept of ideality into a general theory of the relation between culture and mind. In the process, he provides a way to overcome the difficulties associated with the post-Vygotskian elaboration and extension of the concept of mediation.

In contrast to the prevailing wisdom in Russia and much of the Western world, which maintained the Cartesian tradition of conceiving of the problem of consciousness as purely a mental issue (Bakhurst 1997: 38), Ilyenkov pioneered a different stance. He argued that consciousness had a social basis and that in order

two-words of knowledge and, at the same time, to de-couple the teleological aspect of that tradition from my presentation of his ideas.

to understand our mental powers we must understand the nature of phenomena such as meaning and value. For Ilyenkov, the distinctive character of human life is that our behaviour does not emanate directly from the causal influence of the world upon us as many philosophers and social scientists have assumed. It stems from that fact that our thoughts, utterances and actions are, more often than not, governed by reasons. In other words, a recognition that there are grounds for believing such and such or behaving in a particular way. Ilyenkov maintains, as Bakhurst (1997:35) observes, that we cannot understand 'the normative dimension of human activity unless we suppose that ideal phenomena may exist objectively as aspects of our world independent of individual human consciousness'. He introduces the idea that the structure of normative constraints on human action (e.g. logic, language and morality) are borne by social, rather than individual, consciousness because:

'Social consciousness is not simply the sum of many individual consciousnesses, just as the social organism in general is not the sum of many organisms. Social consciousness represents a historically formed and historically developed system of 'objective representations' of forms and schemes of the 'objective spirit', the 'collective reasons' of humanity (or more directly a people with their distinctive 'spiritual culture'

Ilyenkov (1997a: 77)

To clarify how consciousness comes to contain and convey some form of objective representation of social life, Ilyenkov makes two inter-connected arguments. The first argument is that consciousness finds its expression in the culture of specific communities, which are products of human activity, because:

'social consciousness represents forms of human social culture (objectified, substantialized, reified) in matter, that is (a quality) of the historically formed modes of the life of social beings, modes of activity, which confront individual consciousness and will as a special nonnatural objective reality, as a special object, on a par with material reality, and situated in one and the same space as it (and hence often confused with it)'.

Ilyenkov (1997a: 79)

The second argument is culture is materially embodied in two senses: in the form of those practices associated with specific cultures, and in terms of the material world being endowed with significance and value. Cultural phenomena such as semiotic systems, according to Ilyenkov (1991: 256), do not just reside in the heads of human beings or in some ethereal collective consciousness nor do cultural phenomenon such as technology lie external to human beings. Rather they exist in the very character of the world as it is transformed by human beings through practical activity. This implies that the material world comes to genuinely embody ideal properties because, as Ilyenkov (1997a:86) remarks:

'Ideality' is like a peculiar stamp impressed on the substance of nature by social human life activity; it is the form of the functioning of physical things in the process of social human life'.

Cultural phenomena, in other words, reside in the practices of human communities and in the character of the world as it is transformed by those practices.

The concept of ideality presupposes that the world we encounter in experience is, in fact, the product of the exercise of our conceptual powers, both everyday and theoretical. Thus, for Ilyenkov, consciousness, that is, the development of knowledge about and understanding of the natural and social worlds, occur as we participate in different forms of social practice. Hence the common sense world 'speaks to us' in some way because it has been incorporated into a social domain of meaning, and to going beyond the givenness of that world we have to actively engage with theoretical concepts. It can be argued that in formulating this conception of the relation between theoretical and commonsense concepts, Ilyenkov avoided viewing them like Lave and Wenger as folk dichotomies or viewing them like Wertsch as taking a propositional form as a purported representation of a demonstrated truth.

The concept of ideality introduces, therefore, a radically different perspective about the relation between human beings, cultural tools (i.e. semiotic and technological) and the natural world compared with most social theories. It suggests that just as cultural tools possess special significance because they are specific embodiments of human activity, once objects from the natural world are brought into the sphere of human culture, for example, wood, landscape, they also acquire a new form of existence. This new form - an ideal form - was never a part of their physical nature, hence it differs from their original form completely.

'Outside the individual and independently of his consciousness and will exists not only *nature*, but also the socio-historical environment, the world of things, created by human labour, and the system of human relations, formed in the process of labour. In other words, outside the human lies not only nature as such ('in itself'), but also *humanised nature*, nature re-made by human labour. From the point of view of the individual, 'nature' and 'humanised nature' merge together into the surrounding world'.

Ilyenkov (1964: 41-2)

Consciousness for Ilyenkov is neither situated in a purely mental domain nor is it a purely a product of activity; it is, as Bakhurst invoking McDowell (1996) remarks, located in 'the logical space of reasons'. By this Bakhurst means that our external environment constitutes a domain of meaning which humans have shaped. Hence, it offers us reasons for our beliefs and actions. Thus, Ilyenkov's conception of human beings shaping themselves by transforming nature through the creation of culture offers to the discussion of mediation the suggestion there need not be a theoretical impasse between mind and world nor between theoretical and everyday concepts. In doing so, implies that in order to address the enduring legacy of the two worlds of knowledge in post-Vygotskian thought as well as in the response of the educational community to the knowledge economy, it is necessary to consider the social constitution of knowledge.

In light of the trend in social and human sciences since the turn of the last century onwards, there is nothing particularly original, as Chapter 4 pointed out, in being critical of the legacy of Descartes. The critical issue is the extent to which writers attempt to overcome the two worlds of knowledge by articulating a position that strives to understand the social constitution of knowledge, rather than maintaining the dualism by placing their faith in modern versions of 'scientism' (e.g neuroscience), locating consciousness purely in human discourses (e.g. constructivism, postmodernism) or privileging practical activity over semiotic activity (Bakhurst 1997: 36)[3].

The substance of Ilyenkov's contribution to the question of the social constitution of knowledge is that his concept of ideality reveals how nature has been transformed through human activity, thereby providing a way to identify how there can be contact between mind and world. Where John McDowell's work is valuable is that it helps us to understand the link between Ilyenkov's concept of ideality and the normative context that underpins the social basis of knowledge.

Despite the different intellectual traditions from which they emanate, there are many parallels between the work of Ilyenkov and McDowell since both writers seek to erode the opposition between:

> 'the mind and world by portraying the world we encounter in experience as 'made for' by the exercise of our conceptual powers, and both effect this harmony on thinking and being by presenting our human environment as constituting a space of reasons'.
>
> Bakhurst (1997: 47)

McDowell (1994:3) approached this issue differently to Ilyenkov. He aimed not to bridge the gulf between mind and world but to show that there was not gulf to be bridged. The dualism that seem to generate such philosophical difficulty, and

[3] It can be argued that the gist of Ilyenkov's argument about the humanisation of the natural world constitutes the basis for a critique of the more recent schools of philosophy and psychology, for example, neurocognition or constructivism, which have tended to perpetuate the Cartesian dualism (Bakhurst 1997:)

call for speculative philosophical theory to overcome them, are dismantled' (Thompson 2004: 2). McDowell's explored his interest in reconciling mind and world by focusing on how concepts mediate the relation between them and, in the process, he developed a radically new understanding of the nature and limits of knowledge (Bernstein R.J. 2002: 15). The starting point for his development of this new understanding was the misleading picture of the relation between the mind and world that characterised in much philosophy: an impression represented by the twin metaphors of 'inside' (i.e. purely subjective) and 'outside' (presumed to be 'real') our minds.

The source of inspiration for McDowell's understanding of the nature and limits of knowledge was Sellars's (1997) attempt to resolve the tension that Kant's great insight 'That thoughts without contents are empty, and intuitions without concepts are blind' had generated in philosophy (Bernstein R.J. 2002: 10-11)[4]. One of Kant's great achievements, according to McDowell (1996:9), was to recognise empirical knowledge results from some form of integration between concepts and intuitions. The enduring difficulty was that Kant never quite resolved how those two distinct features of experience can resist combination. That is, the idea of experience as a causal notion, denoting the way the world impinges upon us and, the idea it is a normative notion, providing grounds for belief.

McDowell felt that it was helpful to follow Kant and to talk about concepts and intuitions, but he denied that they could be understood in isolation from one another (Thompson 2004: 213). In an attempt to overcome the interminable oscillation between them and to identify their relation to one another he turned to Sellars (1997) distinction between the 'realm of law', which was modelled on

[4] Kant expressed the problem in the following way: 'Without sensibility no object would be given to us, without understanding no object would be thought. Thoughts without content are empty, intuitions without concepts are blind' (Kant 1929). Bernstein R. J. (2002:22) points out Kant's views about concepts and intuitions are open to quite different interpretations because, in the *Critique of Pure Reason* and the *Prolegomena*, he slips between either arguing that knowledge has a conceptual basis (i.e. based on reasons) or arguing that there is an independent world that constitutes the empirical basis of knowledge.

physics, and the 'space of reasons', which comprising our normative notions, including ethics and epistemology (Putnam 2002: 187). The latter concept provided a way to overcome the tension between concepts and intuitions because it denoted that knowing for a human being consists not merely in expressing a response but in knowing what follows from a response (Brandom 2000: 96). Nevertheless, although this allowed Sellers to demonstrate that one can only master a concept (i.e. come to know something) when one has acquired language, it still meant that Sellars, like Kant, perceived nature as having a separate existence from mind.

The attractions of Sellars' concept the 'space of reasons' for McDowell (1994: xiv) is that it can be reformulated to overcome the total separation of mind and world, not just the separation of mind and the social world. This possibility exists once it is recognised that the way we are caught up in the natural world already involves the exercise of conceptual capacities. Stated another way, experience is already conceptualised, it is not the result of subsequent clothing in concepts something that given in non-conceptual form (Thompson 2004:213). Hence the space of reasons implies that knowledge entails a socially rooted concept of reason, thereby providing the basis for ensuring a gap does not open up between mind and world. This stands in contrast to either the abstract formalised notion of knowledge as assumed in much post-Kantian thought, the denial of the possibility of knowledge in post-modern thought or even the post-Vygotskian claim knowledge exists in the form of its socio-cultural expression: 'culture of the mind' or 'mode of practice'. Thus, the space of reasons can be used to refute the idea the limits to thought are provided by an a priori 'given' or the idea the are no limits to thought. In contrast, the space of reasons allows us to appreciate that knowledge belongs in a normative context. As McDowell (1994:xiv) writes:

'In characterising an episode or a state as that of *knowing*, we are not giving a logical description of that episode or state; we are placing it in the logical space of reasons, of justifying and being able to justify what one says'.

This emphasis on the normative context (the space of reasons) that make knowledge possible, according to McDowell, exists outside us in the world, that is, the social world we inhabit. Thus, we are not epistemologically cut-off from the world as it exists 'in itself', rather, for McDowell the central relation individuals have to the world is one of 'openness to the world with no fixed boundaries. There are not only causal constraints on what we can know, but also *rational constraints*' (Bernstein R.J. 2002: 11).

The value of McDowell's insight about the social basis of knowledge for this thesis becomes clear when he discusses his view of the mind's relation to the natural and social world. McDowell identifies the limitations of two prominently held views about knowledge in philosophy and, for that matter, the human and social sciences more generally, which we encountered in the discussion of the role of knowledge in the economy in Chapter 4. The first view which McDowell analyses, which has been described by Sellars (1997) as the 'Myth of the Given', refers to the Cartesian and Kantian notion that experience presents us with some form of raw data, which in order to present an account of that data, the mind somehow conceptualises. The notion of 'givenness', which is one feature of scientific realism, implies therefore that there is something that can be either directly known or known through acquaintance and, moreover, this unmediated given serves as a 'foundation for the edifice of knowledge' (Bernstein R.J. 2002: 11). Thereby placing experience beyond the social basis of consciousness (i.e. the space of reasons).

The second view, which has been described by Davidson (1974) as 'coherentism', maintains mental states can only stand in rational relation to other mental states. Thus, for Davidson (1986: 310), 'nothing can count as a reason for holding a belief except an other belief' because he denies any conception of reality has any rational warrant in reality itself. The cost of this position, according to McDowell,

is giving up the notion that thought has a bearing on the natural and social world[5].

The solution McDowell puts forward is novel: it reflects a concern to go beyond the influence of the Cartesian tradition of operating in a framework in which we distinguish between 'what is 'out there' - what is presumably independently real - from what is somehow 'in' our minds' (Bernstein R.J. 2002:'15). By combining the idea that experience represents the impingement of the external world upon the mind, with the idea that experiences are states in which our conceptual capacities are already engaged, McDowell makes the following argument. It is possible to think of the world as exerting a rational influence over us and view perception as warranting, rather than just causing, belief (Bakhurst 1997: 45). The basis of this rational influence is the placing of an event in the logical space of reasons and the awareness that the space of reasons offers a normative context for judging such events.

For McDowell (1994: 39), when we engage in any judgement of our experience of the world our 'conceptual capacities are not exercised on non-conceptual deliverance of sensibility. Conceptual capacities are already operative in the deliverance of sensibility themselves'. Experience is not, in other words, an apprehension of raw data, rather it is an awareness that '*things are thus and so*' (McDowell 1994: 26). Hence, McDowell argues we must not confine our ideas about conceptual, meaningful and the rational thought to the mind, and to juxtapose these ideas with a meaningless external natural world that is deemed to impinge in someway upon human life. McDowell (1994: 26-8) urges us to explore what he refers to as the mediated basis of our relation with the natural and social world or in his terms the 'unboundedness of the conceptual', that is, the way in which the conceptual permeates the natural and vice versa. We are

5 Although McDowell does not pursue the issue, it is a short step from here to the postmodern position that it is no longer possible to accept there are any epistemological foundations of knowledge.

not therefore trapped somehow in a conceptual sphere that is unrelated to a world that is presumably 'outside' it; rather, as McDowell (1994: 26) observes:

'Thus, the idea of conceptually structured operations of receptivity puts us in a position to speak of experience as openness to the layout of reality. Experience enables the layout of reality itself to exert a rational influence on what a subject thinks'.

We need to hold on to the idea, according to McDowell, that our conceptual and judgemental capacities open us to the world - a world that exercises a rational constraint on our knowledge (Bernstein R. J. 2002: 15). The obstacle to us acknowledging the implications of this observation is an impoverished idea of nature that 'strips nature of everything normative, and immures it within the space of law-governed processes' (Larmore 2002: 197).

The implications of this issue are explored by McDowell by distinguishing between the 'internal organisation of the space of reasons and the internal organisation of nature' (McDowell 1994: 71). He argues that if we want to understand how human action is related to nature and ensure that a gap does not open up between conceptual thought and everyday experience, we must re-think the concept of nature itself. Following Weber, McDowell claims that nature has been viewed since the rise of modern science as a 'disenchanted' world, that is, a 'realm of law where the kind of intelligibility that is proper to meaning is excluded' (Bernstein R. J. 2002: 16). Unfortunately, this is not the whole of nature because nature includes the notion of 'human nature' (Friedman 2002: 28).

McDowell does not want to reject the achievements of modern science, nor does he want to limit our understanding to the disenchanted conception of nature because there is no place for human agency in that conception. He is interested, however, in bringing a responsiveness to meaning back into the 'operation of our naturalistic sentient capacities' and recognises that this is not possible while

'meaning cannot be captured in naturalistic terms, so long as meaning is glossed in terms of the realm of law' (McDowell1994: 77).

To reinsert the concept of meaning into nature, McDowell (1994: 84) turns to Aristotle's insight into our 'second nature' as rational animals, which he claims offers us way to conceptualise the materiality of thought (Friedman 2002: 28). The reason why the idea of second nature is so attractive to McDowell is because it offers a way to integrate the space of reasons into a concept of nature (Bernstein J. M 2002: 218). The Aristotlian argument was that human societies rely upon the development of ethical foundations which, in turn, underpin cultural development and thereby support us to develop a sense of rationality and, moreover, that this rationality orientates us in our practical lives. This line of thinking, as McDowell (1994: 84) explains, opens up the possibility:

'That since ethical character includes, dispositions of the practical intellect, part of what happens when character is formed is that the practical intellect acquires a determinate shape. So practical wisdom is second nature to possessors'.

So, according to McDowell, our interaction with the world enables us to 'open our eyes' and to see the reasons for action or belief that are always there whether we see them or not, and this allows for the possibility of the development of second nature (Pippin 2002: 65). In this sense, McDowell suggests that second nature is both natural and normative: it belongs to nature and the space of reasons.

It can be argued, therefore, that taken together Ilyenkov's and McDowell's respective ideas about the humanisation of nature and the space of reasons provide the philosophical basis to overcome the two worlds of knowledge. By moving beyond such simple opposition as mind and world, culture and nature and recognising the sociogenesis of the mind, McDowell develops a position that is consistent with Ilyenkov. In the process, both writers provide a way to

overcome the criticisms voiced by the post-Vygotskians about Vygotsky's concern for the mediation of theoretical and everyday concepts without losing the value of their insights about the relation between activity, mediation and context. They allow us to appreciate that Vygotsky's argument about the interdependence between theoretical and everyday concepts is not based on some commitment to universal form of rationality or *telos* of development nor is it evidence of his bias in favour of semiotic over practical activity. Instead it is evidence of Vygotsky's deep concern for the relation between mind and world and theory and practice. The implications of Ilyenkov's and McDowell's insights, which have profound implications for our understanding of the role of education in the knowledge economy, are pursued in the next section.

The implications of the idea that all experience is mediated

The notion of ideality and the space of reasons transform our understanding of the two worlds of knowledge in several senses. They neither retain the traditional Cartesian position that everything in our consciousness is ideal and everything outside of consciousness is material, nor do they accept the postmodern position that consciousness and materiality are discursively constructed. Furthermore from Ilyenkov and McDowell's standpoint, the philosophical distinctions between the idea and the material and the epistemological distinctions between the theoretical and the everyday should not be regarded as 'folk dichotomies' nor as evidence of an acceptance of an Enlightenment conception of rationality. Rather they should be viewed as socially and culturally different but related phenomenon.

A number of issues follow from this perspective that, ultimately, have significant implications for how we conceive the purpose of education in relation to the knowledge economy. First, their work constitutes a critique of the Cartesian idea that the point at which the world acts upon us cannot consist in the exercise of our conceptual capacities. Hence for Ilyenkov and McDowell, it does not make

sense to talk as the scientific realists do of the givenness of the natural and social world nor as the postmodernists do of self-authenticating events or experiences. These assumptions resulted in the social and management theorists who were discussed at an earlier point in the thesis in focusing on the contribution that two different types of knowledge - science and everyday, made in the knowledge economy, rather than exploring the inter-relation between them. Second, their ideas provide a way to engage with Lave and Wenger and Wertsch's respective positions that knowledge exists in the form of its socio-cultural expression and Engeström's position about 'theoretically-grasped practice', however, Ilyenkov and McDowell introduce a dimension to this discussion that eluded Lave and Wenger, Wertsch and Engeström. They recognise that modes of semiotic expression, social practice/activity presuppose a socially constructed culture, that entrance into such a culture is a necessary condition of the acquisition of knowledge, and it is this normative basis that constitutes the space of reasons in which the outcomes of mediation are judged. Thus, although Ilyenkov and McDowell do not specifically address the concerns of this thesis, their work offers a starting point for re-thinking the post-Vygotskian critique of Vygotsky.

Following Vygotsky, they accept that although we owe our mental powers to the cultural world into which they are born, this does not mean that culture is something that is essentially external to them. By conceptualising culture in this way, Ilyenkov, McDowell and Vygotsky are not proposing some crude form of social determinism; they are assuming that:

'the spontaneity and creativity of the intellect that is thereby brought forth does not somehow liberate us from the embeddedness in culture. For the exercise of our freedom is always conditional upon the recognition of the constraints the world imposes upon us: a free choice is nevertheless one governed by reasons')[6].

Bakhurst (1995: 168)

[6] This quotation was originally written by Bakhurst to summarise Ilyenkov's position as regards the constraints culture places upon human action. It is my contention that can equally serve as a summary of the position of McDowell and Vygotsky as regards the same issue.

Ilyenkov's and McDowell's concern with the interplay between constraints and reasons on human action add a new dimension to Vygotsky's concept of mediation. By maintaining that ideal phenomena have a supra-individual existence, that is, they exist objectively as aspects of the world independent of individual consciousness, Ilyenkov goes further than Vygotsky because he provides a philosophical basis for the interdependence between theoretical and everyday concepts. The humanisation of the world, according to Ilyenkov, transforms nature in such a way that 'from the point of view of the individual, nature and humanised nature merge together into the surrounding world'. Thus, he explicitly affirms McDowell's thesis about the development of second nature because he reveals how individuals' everyday concepts are shaped by their experience of a humanised world, thereby explaining how they come to contain conceptual qualities.

Furthermore, by pointing out that, at birth, we all enter a conceptual realm (i.e. the normative context that makes knowledge possible) which pre-exists us, and into which we are gradually initiated into, McDowell also goes a step further than Vygotsky and the post-Vygotskians. Instead of stopping when they have identified the importance of learning to talk like a member of a community of practice, the multifaceted nature of mediated action or on the transformation of activity systems; he draws attention to the feature of social practice that they all rely on. This social practice, according to McDowell (1994: 125), is knowing how to place activity, actions, operations in a logical space of reasons and this presupposes knowing that something:

> 'already embodies putative rational linkages between concepts, putatively constitutive of the layout of the space of reasons, before she comes on to the scene'.

To denote these putative linkages, McDowell (1994: 42) invokes the notion of the 'space of concepts'. By this he means that our perception of the relation between concepts does not occur because there is 'indissoluble unity' between experience

and reason as many Kantian influenced philosophers maintain (Bakhurst (2000: 190). Rather, the putative linkages occur because what experience yields is already inscribed with conceptual capacities and thus capable of being located in the space of reasons: a space that is never wholly constituted anew by individuals. For McDowell (1996: 126), we can only understand a concept by understanding its meaning in relation to other concepts, hence his observation that the space of concepts denotes a conceptual framework that enables us to grasp the relations between concepts. And moreover, it is only possible for us to begin to transform concepts and by extension social practice after we have been initiated into the traditions.

Like McDowell, Ilyenkov is also concerned with the way in which concepts allow us to mediate our relationship with the world. Both writers accept that initiation into a culture involves participation in a range of social practices that enable us to come to terms with the patterns of meaning embodied in the material environment. Thus, the acquisition of language is the stepping-stone to assist us in assimilating the different traditions of knowledge that are a part of a society's culture and, in doing so, we are able to develop the conceptual skills that enables us to inhabit the space of reasons.

Echoing Vygotsky, Ilyenkov also places considerable emphasis upon learning language. It not only enables us to manipulate a special class of cultural tools (i.e. theoretical concepts) which reflect different conceptions of, and forms of, knowledge; it also enables us to participate and use cultural tools to change in the world because activity and semiotics are mutually intertwined. In this sense, Ilyenkov recognises that the acquisition of cultural tools enables us, in theory, to begin to transform those practices and meanings.

Thus, explicitly in the case of Ilyenkov and implicitly in the case of McDowell, they elaborate and extend Vygotsky's conception of the way in which we shape ourselves through the creation of culture. They recognise that the natural and

material environment are continually transformed by human activity and in the process endowed with significance and, as we recognise the meaning of this significance and act further to transform the world. Thus, they acknowledge, albeit in different ways, that one of the challenges we face is to constantly engage with a changing environment and to acquire the knowledge and skills to further transform the world.

It can be argued that Ilyenkov's and McDowell's ideas about the relationship between human activity and the rational basis of knowledge can be used to highlight a number of issues as regards the role of education in preparing individuals for working and living in a knowledge economy/knowledge society.

The first issue is the concepts of ideality and the space of reasons can be used to reveal the problems associated with accepting un-problematically either the scientific realist or postmodern premises of the two worlds of knowledge and formulating educational policies in relation to them. Instead of assuming that the purpose of education is to assist learners in adapting to a changing world by providing them with knowledge, which it is assumed is waiting to be revealed to learners and is warranted by qualifications, or assuming that education should support the different forms of knowledge held by culturally diverse communities by accrediting learners' everyday knowledge, Ilyenkov and McDowell imply a radically different approach is needed. In common with Vygotsky and to a lesser extent the post-Vygotskians, Ilyenkov and McDowell introduce a very different conception of knowledge from the one that currently dominates educational thought. Their concepts of ideality and the space of reasons imply that since forms of knowledge are socially rooted, that is, determined by human activity, it is necessary to rethink our ideas about the separation of reason and nature.

Once we conceive of knowledge as being socially rooted, we can appreciate that the capacity to inhabit an idealised environment and to place our knowledge of

that environment in the space of reasons will not be developed through being encouraged to adapt to the demands of a knowledge economy/society. Where Ilyenkov and McDowell differ from post-Vygotskians such as Lave and Wenger, Wertsch and Engeström is they appreciate that if we are to acquire this capacity it presupposes we can perceive the interdependence between theoretical and everyday concepts.

The second issue is that although Ilyenkov and McDowell accept that meaning is something that gets 'made' in and by communities of practice, they do not assume, along with postmodernists that we represent and conceptualise reality by ourselves. To put this another way, they would contest the status of the suggestion from postmodernists that there is no order of things prior to and independent of discourse. Nor would they assume with Lave and Wenger that participation in a community of practice, or with Wertsch that opportunities to use cultural tools to produce new meanings or with Engeström that producing concepts that theoretically-grasp practice necessarily is sufficient by themselves to overcome the two worlds of knowledge. In contrast, Ilyenkov and McDowell provide a way to retain and re-cast those post-Vygotskian's respective insights about participation, mediated action and the expansion of the object of activity. Ilyenkov and McDowell would maintain that it is important to appreciate how we develop through participation in social practice, appropriating cultural tools and using the CEL, the ability to infer what follows and what does not follow from placing actions, events and concerns within a space of reasons.

The third issue is that Ilyenkov and McDowell both acknowledge that over a period of time our engagement with the natural and social world results in the constant transformation of that world. Unlike Engeström, who assumes that it is possible to transform activity systems through the application of the cycle of expanded learning, it can be argued that Ilyenkov and McDowell would adopt a rather different stance. They would maintain that unless we perceive the way in which the conceptual constantly permeates the everyday and vice versa, it is

difficult to create new knowledge and to locate that knowledge within a space of reasons.

In light of the above interpretation of Ilyenkov's and McDowell's ideas in relation to the concerns of this thesis, there are a number of pedagogic issues that will have to be considered. The first issue is to identify the pedagogic practices which facilitate the capability to perceive the relation between concepts and to infer what follows from placing actions, events and concerns within a space of reasons. The second issue is to identify how to assist us in creating new knowledge and in negotiating a new space of reasons within which to locate that knowledge. Their ideas, as we shall see in the next section, as regards how to address these pedagogic issues are rather under-developed in comparison with the subtlety and sophistication of their philosophical analysis of the humanisation of the world and the identification of the social basis of knowledge.

Activity, language and knowledge

In an attempt to explain the development of cultural identity while remaining consistent with his ideas about second nature, McDowell turned to Hegel (Bernstein R. J. 2002: 10; Bubner 2002: 210). Following Hegel, McDowell (1994: 87-8; 123-4) argued that the crucial component of the formation of a cultural identity is the acquisition of language, through a process of, what he, following the classic German philosophical tradition from Herder to Von Humbolt, refers to as '*Bildung*' (Bubner 2002: 211). McDowell assigns *Bildung* a central element in the normal maturation of human beings because the concept encapsulates the discovery of possibilities and capacities whereby character is shaped, not only in accordance with socially established ideals, but also through the development of personality. In this sense, the concept is used to reinforce his ideas about the development of second nature.

For McDowell (1994:126), the feature of language that really matters is that it serves as a "repository of tradition, a store of historically accumulated wisdom about what is reason for what." Or to put it another way, through the learning of language we acquire an initiation into the space of reasons because we do not just learn language as though there was a literal meaning to words and concepts. It is through language that we, according to McDowell, open ourselves to the world and raise ourselves above the stimulus-determined animal behaviour (Bubner 2002:214)[7]. Thus, he implicitly affirms what Scribner (1985) refers to as,Vygotsky's concern with the significance of the phylogenetic aspect of human development. That is, the way in which the gradual accumulation of knowledge within different societies constitutes an invaluable conceptual resource to help us make sense of the relations between experience and judgement; not least because as McDowell observes 'if a human being is to realise her potential.... the first thing that needs to happen is for her to be initiated into a tradition as it stands' (McDowell 1994:126)."

By using the idea of 'tradition' to acknowledge the importance of human beings being familiarised formally through education with the stock of knowledge accumulated within a society, McDowell implicitly acknowledges the importance of another one of Vygotsky's concerns, namely the socio-cultural aspect of human development. That is, it is the socio-cultural activity of formal education which facilitates the historical and cultural communication of knowledge, and through its research functions is one of the agencies in advanced industrial societies which is concerned with the transformation of knowledge or production of new knowledge.

One of the reasons for this emphasis upon *Bildung* is because McDowell is more sensitive than Lave and Wenger and Wertsch are to the generalisability of the

[7] Bubner (2002: 214) points out that although McDowell enhances his thesis in *Mind and World* through his discussion of language and meaning, he does not really develop this 'hermeneutic turn', an observation that McDowell (2002:297) accepts in his reply to Bubner.

knowledge contained in different traditions, such as science, the humanties, and its potential value beyond its immediate context of transmission.

'Being at home in the space of reasons involves not just a collection of propensities to shift one's psychological stance in response to this or that, but the standing potential for a reflective stance at which the question arise whether one ought to find this or that persuasive'.

McDowell (1994:125)

Thus, McDowell interweaves his concern to use tradition to alert us to how our use of language enables us to grasp the social and historical basis of epistemology and to alert us to how language use facilitates the development of a 'reflective stance'. In this sense, he is sensitive to but not directly concerned with discussing the following pedagogic issue; how to critically examine whether the goals and authoritative reasons for the organisation of social practice are self-undermining on the terms set for them.

Nevertheless, despite displaying this sensitivity to the generalisability of knowledge and hence the interconnections between concepts, McDowell appears to assume that developing the capacity to generalise and spot interconnections is both an intrinsic and automatic feature of education. *Bildung* appears to be a magical place where humans leap from meaninglessness into the demands of reason because McDowell does not pause to reflect upon the pedagogic approaches that facilitate learners to acquire these capabilities.

It is difficult therefore to use McDowell's ideas about *bildung* to engage except at a very general level with Vygotsky's ideas that learning theoretical concepts repositions us in relation to the natural and social world, let alone with Lave and Wenger's ideas about participation in communities of practice or Engeström's interest in expanding the object of activity. Furthermore, although McDowell emphasises the historical and cultural basis of knowledge, he does not really 'spell out what the reasons are.. (nor) what the world would be like, if it is to be

understood as containing reasons' (Larmore 2002: 196). Hence he avers any consideration of the contested nature of reason and the negotiated character of meaning.

In contrast to McDowell, Ilyenkov's interest in language manifests itself in a very different way: he is interested in how concepts could be used to change understanding and activity. Ilyenkov (1971: 258) established his ideas about concept formation by contrasting them with what he referred to as the 'empiricist's theory of concept formation'[8]. He argued that his approach constituted an advance over empirical approaches to concept formation which dominated philosophical thought and educational practice because 'a concept is something more simply than an abstract universal fixed by a word, the meaning of the general term' (Ilyenkov 1977b:258-9).

For Ilyenkov, concepts should not simply express the properties an object or phenomenon shares, they ought to include '*what accounts* for the similarities and differences in their various manifestations' (Bakhurst 1991: 147). Thus, like McDowell, he also appreciates the generalisability of certain forms of knowledge. Ilyenkov's starting point to achieve this objective was to argue that in order to comprehend any object of study, for example, a discipline or the natural environment, it is essential to grasp the interconnections that characterised that object. Ilyenkov, as we saw in the discussion of Davydov and Engeström in Chapter 7, represented cognition (i.e. concept formation) as a movement from the 'abstract' to the 'concrete'[9]. Ilyenkov used the term concrete to refer to the outcome of cognition that allowed someone to grasp the holistic quality of this interconnectedness. Thus, for Ilyenkov, the object of knowledge is to understand 'a 'system', 'totality' or 'whole' which is composed of individual phenomena

[8] The empirical tradition that Ilyenkov primarily had in mind was the lineage inspired by Locke and Hume. It has been argued by Engestrom (1987) that although written over three decades ago, the main features of Ilyenkov's characterisation of the empiricist's approach to concept formation still pertain in more modern versions of this tradition.

integrally related to each other' (Bakhurst 1991: 139). In this sense, there are clear affinities between McDowell's concept of the space of concepts and Ilyenkov's notion of ascending to the concrete. The former refers to the normative basis of knowledge, while the latter refers to pedagogic activity involved in understanding the relationship between concepts.

Ilyenkov (1977b: 87) points out the limitations of perceiving an object without grasping the 'whole concrete chain of interconnections' within which it exists. He argues that unless we are encouraged to perceive an object in terms of its 'interconnections' with other things, facts, phenomenon, we perceive it in an extremely one-sided way. Echoing Vygotsky, Ilyenkov (1977b:88) argues the empirical tradition of cognition results in the construction of concepts through the separation of certain arbitrary features of objects from their interconnections. Equally, echoing McDowell, Ilyenkov argues individuals do not construct a picture of the world from scratch because 'the starting point of cognition is not unprocessed sense experience but a conception of the world *inherited* 'already made' from the community of which he or she is a member' (Bakhurst (1991:150).

For Ilyenkov, it is only by alerting us to the existence of an already made world that we are able to develop the capability to apprehend and reconstruct the systemic and interconnected nature of the object or phenomenon under study. Hence his ideas about concept use are an advance over the empiricist, postmodernist and post-Vygotskians such as Lave and Wenger and Wertsch because he appreciates that there are properties in the world that only get there as a result of human activity (Bakhurst 1991: 153). Thus, from this standpoint, comprehending a phenomenon presupposes discovering its:

[9] Ilyenkov felt that the potential applications of this method were not restricted to political economy, they were a necessary condition of inquiry in any domain (Bakhurst 1991: 135).

'mode of its origin, the rule according to which the phenomenon emerges with necessity in the concrete totality of conditions, it means to analyse the very conditions of the origin of the phenomena. That is the general formula for the formation of a *concept*'.

Ilyenkov (1977b: 177)

Identifying a kernel concept, according to Ilyenkov (1977: 272) as we saw in Chapter 7, presupposes a number of activities. First, the identification of the systemic nature of the interconnections or patterns of meaning which exist between phenomena, the negotiation of which constitutes thought. Second, the identification of the series of contradictions which exist at the heart of these interconnections because the struggle and mutual dependence of opposite forces or elements constitutes the driving force for change in fields of knowledge. Thus, for Ilyenkov, the next generation of concepts are usually directly derived from explicitly addressing contradictions or can be traced at a later time to the legacy of such contradictions.

Given the subtlety of his analysis of the concept of ideality and his explanation as to how human values and meaning are stamped upon the world, Ilyenkov veers at times towards a rather instrumental explanation of how we grasp concepts. He is inclined to imply that we assimilate concepts in their complete form, rather than to follow Vygotsky and acknowledge concept formation is a complex evolving creative process. One consequence of the legacy of Ilyenkov's ideas about concept formation, as we saw in the discussion of Davydov's cycle of learning actions which tried to operationalise his interpretation of the principle of moving from the abstract to the concrete, is that it resulted in an overly formalistic pedagogy. Thus, Davydov glossed over the extent to which kernel concepts are inevitably situated: they are situated in relation to their context of origin; and the context in which they are initially introduced to learners (Guile and Young 2003: 74). Hence it was apparent that it would be necessary to re-think Davydov's cycle in order to overcome the double situatedness of concepts.

Furthermore, Ilyenkov is inclined to imply that we will automatically understand a concept once we have grasped the contradictions that resulted in its genesis. One consequence of this assumption, as we saw in the discussion of Engeström's cycle of learning, is that his ideas have been used to justify an object-orientated conception of learning which assumes the establishment of meaning is coextensive with the creation of new concepts in activity systems. This assumption about learning disregards the extent to which the outcome of learning often occurs as a result of us being diverted and distracted from our object of inquiry through a 'metaphorical leap' into the unknown (Prawat 1999b: 265). It also takes for granted that because we are actively involved in the production of a new concept we have necessarily developed the capability to use the concept to reason why something is or is not the case.

Taken together, it can be argued that although Ilyenkov and McDowell touch upon pedagogic issues, they do not addresses the negotiated character of meaning, which, as Vygotsky appreciated, is central to understanding the development of, and by extension the application of, concepts. This observation serves as the link to the next chapter and the discussion of the work of Robert Brandom.

Conclusion

The starting point for this chapter was the claim that Ilyenkov's and McDowell's ideas about ideality and the space of reasons provided the philosophical basis to appreciate that the natural world can contain meaning, normativity and reasons and hence why there is no gulf to be bridged between mind and world. The chapter went on to argue this focus on the relationship between meaning, normativity and reasons provides the epistemological underpinning to overcome the two-worlds of knowledge. The chapter maintained that this position raises a number of pedagogic issues for consideration. It defined them as the pedagogic practices that facilitate the capability to:

- perceive the relation between concepts;
- infer what follows from placing actions, events and concerns within a space of reasons;
- create new knowledge and to negotiate a new space of reasons within which to locate that knowledge.

The chapter noted that although these issues arose from the discussion of Ilyenkov and McDowell neither writer really got to grips with the pedagogic implications of their own arguments. Hence the chapter concluded that it is necessary to explore further their pedagogic implications.

Chapter 9

Beyond the two worlds of knowledge (4): Pedagogic considerations

Introduction

The aim of Chapter 9 is to consider a number of pedagogic issues raised in the last chapter. The chapter starts by recapping briefly the way in which the Ilyenkov and McDowell's ideas allow us to overcome the differences that appeared to have been opened up between Vygotsky and the post-Vygotskians. Specifically, it reminds us that it is only when we the link between concepts, reasoning and activity that we can grasp that there is not necessarily a gap between mind and world.

The chapter introduces the ideas of Robert Brandom to elucidate the links between these issues. It points out that locating concepts in the space of reasons presupposes, for Brandom, a form of knowledgeability - 'giving and asking for reason' that is based on the social practice of establishing inference. That is, understanding what follows from adopting a specific position, why it follows and its implications for future thought and/or action. The chapter maintains that, in principle, Brandon's concept of knowledgeability constitutes the pedagogic basis to facilitate the mediation of theoretical and everyday concepts. It notes, however, that since Brandom is primarily concerned with issues in the philosophy of mind, he does not explore the way in which the giving and asking for reasons is inevitably influenced by the purpose of learning and the cultural tools we use to support the practice of reasoning. The implication of this observation is then explored in Chapter Ten in relation to the three purposes of learning - repositioning, participating and expanding that arose from the discussions of Vygotsky and the post-Vygotskians in Chapter Six and Seven.

Concepts, reasoning and activity

The significance of living in an idealised world for educational policy

The last chapter tackled the chasm that seemed to be opening up between Vygotsky and the post-Vygotksians as regards theoretical and everyday concepts. By drawing on Ilyenkov and McDowell, it argued this problem once we appreciate that: the natural and physical world is not a disenchanted world (i.e. devoid of meaning). It is, in fact, a world 'idealised' by human action; and that we should 'think of reality as not lying outside the sphere of the conceptual but as somehow contained within it' (Bakhurst forthcoming).'

One consequence of adopting this perspective is that Chapter 8 introduced a richer conception of the world and our relation to it than scientific realists, postmodernists and many post-Vygotskians typically allow. Chapter 8 could have conceived of theoretical and everyday concepts in accordance with the tenets of scientific realism or postmodernism and treated them as separate and different or as equal modes of human representation. Furthermore, it could have followed the tendency of some post-Vygotskians to treat the distinctions as evidence of a lingering faith in Enlightenment conceptions of knowledge and truth or folk dichotomies. Instead Chapter 8 provided the philosophical basis for the explaining the difference as well as the interdependence Vygotsky perceived between theoretical and everyday concepts. This claim can be demonstrated through reference to a number of philosophical presuppositions that inform Ilyenkov and McDowell's ideas.

The first underlying philosophical presupposition of the argument about the idealisation of the world is that both theoretical and everyday concepts emerge though human activity. The reason for the difference between the two concepts

is that the object of activity is in each case is very different. Theoretical concepts arise in historically constituted specialist fields of knowledge, as Derry (2003: 176)[1] observes through experts in those fields using the activities, procedures and techniques of theoretical inquiry to 'prise reality into expressing itself in forms which do not exist without it'.

One of the outcomes of this activity is that theoretical concepts become part of a system of inferentially connected concepts, each one containing its own specific generalisation. In contrast, everyday concepts arise through the continual reciprocity of ideas through activity and their successive re-formation in thought. They may contain generalisations but these generalisations refer to the taken-for-granted features of the world identified in most instances through sense experience, rather than generalisations about those aspects of the world which are mot immediately apparent to sense experience.

This conception of theoretical concepts, which is consistent with Vygotsky, Ilyenkov and McDowell's position, is not foundational in the classic sense of the term, that is, it does not constitute a mirror image of reality as scientific realists maintain. Nor does it assume as postmodernists do that theoretical concepts emerge because we construct a world in our own image nor that they are a culture of the mind as certain activity theorists assume. In contrast to scientific realists, postmodernists and post-Vygotskians such as Engestrom, Lave and Wenger, Leontiev and Wertsch, it acknowledges that conceptual foundations are built up historically, socially and culturally as they capture an 'idealised' world.

The second underlying philosophical presupposition can be succinctly expressed through McDowell's phrase 'the unboundedness of the conceptual'. By this he means that the conceptual permeate the everyday world and vice versa. This

[1] Derry (2003) points out that Vygotsky's dynamic conception of knowledge creation is frequently misunderstood by Wertsch, Wells and other activity theorists because they fail to spot the 'Hegelian provenance' of his theorising, thus, they accuse him incorrectly of being an 'abstract rationalist'.

happens, according to McDowell, because our activity in the world results in theoretical concepts becoming part and parcel of everyday life in ways we often do not recognise. For example, the way in which the concept of bureaucracy is invoked in an 'everyday' sense in conversation to offer a causal explanation of the constraints on our actions. As a result, we lose sight of the origins of the concept and the generalisation that lies at the heart of a theoretical concept can come to acquire a commonsense meaning. This process occurs as Vygotsky acknowledged because of the mutual restructuring that goes on between theoretical and everyday concepts.

The significance of this conception of the interdependence between theoretical and everyday concepts for educational theory, policy and pedagogic practice can often appear illusive, not least because the legacy of the two worlds of knowledge pervades education in a number of ways. It perpetuates the idea that we live in and mechanistically adapt to a changing external environment such as a knowledge economy, thereby effectively maintaining the idea that changes in physical, natural and social structures cause us to change our behaviour. It also continues to perpetuate the idea of objective knowledge of matter and subjective knowledge of thoughts and experiences; thereby leaving us searching for an explanation of the connection between the theoretical and the everyday.

One consequence of the acceptance of the two worlds of knowledge in educational studies and educational policy is that we are left without any way of acknowledging the way in which our actions 'idealise' those structures and provide us with reasons for acting in particular ways (Derry 2003). Hence it leaves us, as we saw in Chapter 5, floundering around in the high ground of theory, the swampland of practice or the uncertain territory of reflective practice. This is not an entirely new pedagogic dilemma; it has been a feature of debates about theory and practice in education for a number of years (Schon 1987). What is new, as previously noted, is that the knowledge economy is making the interdependence between theoretical and everyday concepts to be made more

explicit than ever before. Three expressions of this development have been identified in this thesis. The first is Gibbons and colleagues and Nonaka and Takeuchi's argument that everyday concepts are an integral part of the new forms of knowledge they claim is being produced. The second is Zuboff's argument that the symbolic data (i.e. everyday concepts) that we encounter in informated environments is coded in accordance with statistical maxims and often requires us to have some form of theoretical knowledge if we are to fully understand that data. The third is Hage and Power's argument that the new forms of collaboration that are emerging between professionals presuppose that they are able to mediate between different types of theoretical and everyday knowledge. Hence there is greater pressure to address the dilemma of theory and practice than previously.

Responding to this challenge, which is the main concern of this thesis, entails reversing the cumulative effect of the policies and pedagogies that inadvertently precludes learners from exploring the way in which we inhabit and continually transform an already idealised environment. Appreciating the idealisation of the world implies a conception of knowledge based on the relation between, rather than the separation of, theoretical and everyday knowledge. The first step in overcoming the legacy of the two worlds of knowledge in educational culture is to clarify the pedagogic implications of living in an idealised world. The second step is to identify the new forms of knowledgeability that allow us to locate concepts in the space of reasons and, in doing so, facilitate epistemic activity.

The pedagogic implications of living in an idealised world

It has maintained here that the idea that we live in an idealised world and that the conceptual permeates the everyday introduces a radically new perspective about knowledge and learning compared to the notions advanced in current educational policy. Before exploring the implications of this idea for the mediation of theoretical and everyday concepts, it is necessary to dispel some of the possible misinterpretations of this claim. There are at least four possible ways in which the

idea that we inhabit and continually transform a world already imbued with meaning could be misinterpreted. The first three possible misinterpretations are likely to arise as an explicit result of the legacy of the two worlds of knowledge in educational policy and pedagogy, while the forth could arise from an Activity Theory critique of the two worlds of knowledge.

The first way in which the notion of the idealisation of the world could be misinterpreted is to assume it is another way of expressing the cultural anthropological assumption that culture serves as the mediating link between mind and world. This assumption about culture was, as we saw in Chapter 5, one of the influences behind the widespread adoption of the 'pedagogies of reflection' in higher education. The adoption of a culturalist perspective to interpret Ilyenkov and McDowell's ideas about the relation between individuals, culture and the world is likely to result in little more than an extension of the aforementioned pedagogic approaches.

The second way in which the notion could be misinterpreted arises from the influence of postmodernsim, as we saw in Chapter 5, in debates about pedagogy in higher education. This could result in the argument that external objects are infused with ideality simply being taken to mean that the world is even more culturally diverse than educational policy and higher education has been prepared to acknowledge up to now. This interpretation is likely to result in an extension of the post-modernist argument that learners should have access to wider conceptions of knowledge than those conceptions normally valued in higher education. The third way in which the notion could be misinterpreted is to assume Ilyenkov and McDowell are advocating a form of social determinism which should be rejected at all costs.

The fourth possible misinterpretation emerges from sections of the intellectual community in Activity Theory who have extended Vygotsky's theory of cultural development through their interest in exploring the implications of cultural

diversity for human development. One of the features of the work of post-Vygotskians such as Wells (1999) who are concerned about cultural diversity is to be critical of the tendency in mainstream education to accept the superiority of scientific rationality and the benign consequences of schooled instruction. This leads Wells (1999: 325) to argue that educationalists must 'reject the view that treats the trajectory of Europen cultural history as the point of reference for evaluating other cultures', concluding that it is essential to develop pedagogies which enable learners to 'create their own alternative versions of the future' (Wells 1999: 331). One of the paradoxes of this response is that Wells ends up perpetuating, even though his position is a critique of, the two worlds of knowledge because he assumes that new representations are created independent of any contact with existing bodies of knowledge. This happens because Wells clings to a residual dualism through his adherence to the representational paradigm[2], which was discussed in Chapter 4, which assumes that concepts are a mirror image of the world.

To fully grasp the pedagogic implications of the claim that the world is imbued with meaning for Vygotsky's distinction between theoretical and everyday concepts, it is helpful to recap briefly Vygotsky's theory of cultural development. The guiding idea behind Vygotsky's theory of cultural development is that cognition develops through engaging with a world laden with meaning and significance. This presupposes that we mediate theoretical and everyday concepts and this social practice constitutes, from Vygotsky's perspective as Young (2003: 107) has argued, 'the process of learning'.

Once cultural development is conceived in this way, we can see how we develop consciousness as we assimilate culture, that is, make it our own, and how the social basis of reason is established. Moreover, this conception of cultural development implies it is difficult for us to understand knowledge and how it supports

[2] As Derry (2003) has observed, there are affinities between the work of certain Activity Theorists and many theorists who operate within the constructivist paradigm.

economic, social and cultural development from just contact with everyday concepts. The advantages of having contact with theoretical concepts is that they allow us to:

> 'appreciate the internal essence of things, for the nature of things is disclosed not in direct contemplation of one single object or another, but in the connections and relations that are manifested in movement and development of the object, and these connect it to reality'.
>
> Vygotsky (1998: 54)

Ilyenkov and McDowell's arguments about the idealisation and conceptual unboundedness of the world enable us to grasp the full implications of Vygotsky's insight that thinking in concepts allows us to appreciate the relation between things in the world. They point out that one outcome of this process of cultural developments is that we gradually acquire what McDowell referred to as, our second nature. It is through the acquisition of our second nature that we develop our creative and spontaneous intellect and become more aware of the enabling and constraining effect of cultural norms. This development allows us to inhabit a world where we can be described as acting freely. This freedom nevertheless remains conditional upon the recognition that there are constraints in the world; these constraints are social and cultural creations. Hence thought and actions are governed by the reasons that the external environment offers us as a result of our acting in the world, not because the world causes our behaviour.

At first sight, these observations about freedom may appear counter-intuitive. It is normally assumed that human biology determines our actions, for example, the need for food, as much as the natural environment, determines our actions, for example, the need for shelter. The argument about the connection between freedom and reasons that Ilyenkov and McDowell make does not accept that human motives are entirely biologically determined or caused by the influence of external physical or social structures. In contrast, although Ilyenkov and McDowell would accept that the need for food and shelter are biological universals, they

would argue they do not act as psychological motives in defining human activity. Stated another way, food and shelter may be prerequisites for activity but they do not determine or cause activity, the choices we make are based on the social practices we use to reason with one another.

Thus, by articulating the social roots of reason Ilyenkov and McDowell help to make explicit Vygotsky's argument about the linkages which exist independent of our encounter with them. The first linkage is between different theoretical concepts in historically formed domains of knowledge. The second linkage is between theoretical and everyday concepts[3]. Given that the thesis maintains that one of the key characteristics of the knowledge economy is to make the interdependence between theoretical and everyday concepts much more explicit, it is important to identify the significance of their relationship in an 'idealised' world.

In the case of the first linkage, Vygotsky maintains following Marx, as we have seen in Chapter 6, that if the form in which anything is manifested and its essence corresponded directly with one another we would not need theoretical concepts. Thus, Vygotsky argues that the natural and social world is not given to us nor is it simply apprehended through representations, rather it comes to us through our own purposes and intentions being realised in activity. This means it is not helpful to portray theoretical concepts as the expression of abstract reason applied to the world, as a number of scientific realists assume nor as some abstraction about the world as a number of postmodernists and post-Vygotskians imply (Derry 2003: 175). The reason this is an unhelpful characterisation of theoretical concepts is because, as Vygotsky points out, even:

'the most immediate, empirical, raw, singular natural scientific fact already contains a first abstraction. The real and the scientific fact are distinct in that the scientific fact is the real fact

[3] Even though Vygotsky did not discuss linkages between everyday concepts, it follows from his argument that there are linkages between different everyday concepts because they are formed in an attempt to help us make sense of our experience of the world. Hence there will be some 'relation' or 'connection' between them.

included in a system of knowledge..... The material of science is not raw, but logically elaborated, natural material which has been selected according to a certain feature. The fact itself of naming a fact by a word is to frame this fact in a concept ... it is an act toward understanding this fact by including it into a category of phenomenon which has been studied before'.
Vygotsky (1997a: 249)

This emphasis upon the constructed nature of scientific concepts should not be taken to imply similarity between Vygotsky's ideas and, what are commonly called, 'constructivism' or 'constructionism' in the social sciences. The former is closely associated with certain directions in the Sociology of Science that only accepts definitions as to what we take to be real that are based on human interpretation of the world. The latter is a theoretical approach in Social Psychology derived from Piaget's original work on concept formation. It stresses that the mind creates the world as we know it, hence there could be as many realities as there are minds. In this sense, both constructivism and constructionism accept implicitly the two-worlds of knowledge: the world is assumed to be devoid of meaning until we impose meaning upon it hence knowledge creation is a purely mental process.

One of the consequences of the widespread interest in constructivism and constructionism in educational studies and activity theory has been a call for pedagogic approaches that deny that knowledge has any foundations, and affirm that learners should be encouraged to construct their own interpretations of their experiences (Derry 2003: 64). The Vygotskian, Ilyenkovian and McDowellian idea of a developmental aspect to meaning in the process of learning is viewed with suspicion; it introduces automatically for 'constructivists' and 'constructionists' the 'issue of the source of that meaning' (Derry 2003: 70). One consequence is that the sidelining of any sense of the universality of knowledge through the privileging of contextually sustained activities of participants results in highly psychological and individualistic conceptions of learning (Cobb 1994).

Thus constructivism and constructionism offer very rather different philosophical standpoints about knowledge and pedagogy compared to the argument Vygotsky is making. It is clear from the above quotation that Vygotsky is arguing that the links, dependencies, and relationships amongst things that constitute the content of different theoretical concepts are not the visually perceivable qualities of things. Rather, they come to light through thought, that is, by understanding the mediating connections which allow a concept to be placed in a wider system of concepts that are a part of a domain of knowledge. It is understanding this set of mediating connections that allows us to begin to appreciate what it means to live in an idealised world.

For example, understanding Lave and Wenger's concept of situated learning involves two different sets of mediating relations. The first relation is between the context of learning (i.e. community of practice), the cultural process that facilitates membership of the community (i.e. legitimate peripheral participation) and the cultural tools that foster learning (i.e. the learning curriculum). The second relation is between the Hegelian philosophical presuppositions informing situated learning compared with, say, the Kantian philosophical presuppositions informing cognitive theories of learning. The argument that the mind emerges in social activity as opposed to the idea that the mind already has within it (i.e. a priori) the means to construct the world in a particular way. Failure to do so results in the former concept losing its distinctive system of mediating connections and becoming seriously diminished in the process.

In the case of the second linkage, Vygotsky does not, as we have seen, assume a linear development from everyday to theoretical concepts, he acknowledges the former, which are saturated with rich personal experience, and can act back on the latter and vice versa through a process of conceptual restructuring. This means, for example, that it is possible for our everyday concept of learning, which has been shaped and influenced by our personal experience of schooling and so forth, to be restructured through understanding the implications of Lave and Wenger's

argument that learning is situated. Moreover, the theoretical observation that learning is enriched through becoming associated with a broader base of experience. The net effect of this iterative relationship between theoretical and everyday concepts is to reposition us in relation to the natural and social world. The implications of this claim is returned to in Chapter Ten.

Thus, it is possible to use Vygotsky's insights about the linkages between different types of theoretical concepts or between theoretical and everyday concepts to argue that they reposition us to act differently in relation to objects, activities and the world. To begin to understand this claim, it is necessary identify the pedagogic implications of locating concepts in the space of reasons.

The pedagogic implications of locating concepts in the space of reasons

By making explicit that acting in the world presupposes grasping the interdependency between theoretical and everyday concepts, Ilyenkov and McDowell introduce a different conception of knowledge and explanation from scientific realists, postmodernists, and post-Vygotskians such as Lave and Wenger and Wertsch. They make the case that if you want to develop an adequate conception of knowledge you have to 'represent it as issuing from an appreciation of reasons' (Bakhurst forthcoming)[4]. This conception finds its clearest expression in McDowell's (1995: 888) observation that:

'The space of reasons is the space in which thought moves, and its topography is that of the rational interconnections between conceptual contents; we might equally speak of the space of concepts'.

McDowell is arguing that operating in the space of reasons entails having concepts that pertain to an act of perception and concepts that pertain to the act of communication. By this he means that in order to make sense of things there has

[4] McDowell is inclined to conflate the difference between the type of reason associated with a theoretical as opposed to an everyday concept. This issue is pursued in the next chapter.

to be a 'dual dependence between the kind of knowledge expressed in perceptual reports and an overall world view' (Thompson 2004: 223). The perceptual report not only has to be 'reliable', that, is have authority, but that the report also has to be recognised in some sense by the person whose report it is.

Translated into the argument of this thesis, it can be argued that even though McDowell does not specifically differentiate between theoretical and everyday concepts he is making a two-fold argument. First, he is arguing the natural and social world affords us appearances that allow us to have dealings with content; hence we should think of reality as 'not lying outside the conceptual but as somehow contained within it' (Bakhurst forthcoming). Once we have adopted this position it is possible to appreciate that appearances are 'starting points from which we can move about in interior space, the space of reasons, drawing inferences from them in ways that reason can endorse' (McDowell 1995: 889).

To clarify the logic that lies behind this line of argument, McDowell (1995: 891) notes 'there cannot be any predicament in which one is receiving testimony from one's senses but has not yet taken any inductive steps'[5]. Using the example of colour, he argues that before we can offer any testimony of our experience of colour we already need to know a great deal about, for instance, the effect of different sorts of illumination on colour appearances. This observation anticipates the second strand of his argument that once we are introduced to theoretical concepts and their meaning in relation to one another, we begin to appreciate theoretical concepts are cultural tools that facilitate our ability to reason beyond relying on the experience of perception.

This form of reasoning presupposes knowledge of concepts that originate outside the immediate delivery of the senses and an appreciation of the way in which those

[5] Taylor (2002: 111) takes McDowell to task over this assertion arguing that the pre/non-conceptual is a form of knowing. McDowell (2002: 283) rejects this position on the grounds that Taylor fails to appreciate that 'actualisations of conceptual capacities must be seen as manifestations of life as opposed to operations of pure intellect'.

concepts help to restructure our understanding of experience. This knowledge might have been gained through formal education or knowledge accumulated through using our different experiences of colour to build up a fuller understanding of the concept of and the effects of colour, Nevertheless, McDowell 1995: 891) concludes that, irrespective of which type of concept we call upon to interpret our experience of colour, there is:

'no making sense of that possibility unless one's conceptual space already embraces a world with more to it that is immediately present to the senses'.

In offering this example of the unboundedness of the conceptual, McDowell elucidates the philosophical implications of Vygotsky's claim that theoretical concepts act back on everyday concepts. The cornerstone of this process, according to Vygotsky, is that our understanding of the generalisation contained within a theoretical concept is built upon our prior foundations of knowledge. These foundations consist of our own personalisation of theoretical and everyday generalisations and, as such, influence the way to understand and subsequently use the new generalisation when speaking and thinking. McDowell supplements this position by making it clear that our personalisation of a generalisation is only meaningful when we can locate it in the space of reasons.

It can be argued that although McDowell does not explicate his example of the way in which the use of colour in everyday conversation is mediated by prior knowledge of colour in similar terms to Vygotsky, he recognises the centrality of mediation to thought moving in a space of reasons. He is not arguing that we can act on the basis of what is immediately present to our senses, nor on the basis of what is captured by our representations. McDowell is pointing out that our conceptual understanding embraces a world that has been shaped by the interrelation between theoretical and everyday concepts, and this allows us to operate meaningfully in the world. Stated another way, we constitute the world of colour through our ability to mediate theoretical and everyday concepts, we are

able to develop new ways of making sense of the world, the world of colour is not 'given' to us.

The conception of knowledge and learning advanced by McDowell is informed by Sellar's suggestion that the primary purpose of concepts is to support reasoning rather than to serve as descriptions of the world. This is an intriguing idea which rests on a number of assumptions about mediation that are not fully explicated by McDowell, and for this reason, the chapter turns to the work of Robert Brandom[6].

Brandom, like McDowell, also takes as his starting point the idea that the primary purpose of concepts is to support reasoning (Thompson 2004:220), moreover, Brandom's ideas were, as McDowell (1994: ix) acknowledges, a pervasive influence on his book *Mind and World*[7]. The idea knowledge can be understood as standing in the space of reasons is endorsed by Brandom (1995: 895), however, he feels McDowell has under-emphasised the social basis of his own concept. As Brandom (1995: 902) observes:

'The complaint I want to make about McDowell's discussion is that he makes nothing of the essential social articulation of that space'.

The reason for this oversight, according to Brandom, is that McDowell implies that we can achieve flawless standings in the space of reasons through our own efforts, rather than recognising that we need to engage in particular forms of social practice to accomplish such understandings.

[6] Like McDowell's book *Mind and World*, Brandom's book *Making it Explicit* has been widely accorded the status of a 'milestone in theoretical philosophy' because of the painstaking way that it works out the connection of formal prgamatics and inferential semantics (Habermas 2000). I have mainly drawn on Brandom's subsequent book *Articulating Reasons* which develops certain themes that were originally presented in the former book.

[7] Just as Bakhurst has identified that Ilyenkov and McDowell share similar concerns which are relevant for Activity Theory, it is gradually being appreciated that Brandom and McDowell's concerns and arguments also have a direct bearing on post-Vygotskian debates (Derry 2003:44).

It is my contention that it is a short step from Brandom's concern with identifying the social practices we employ to establish the meaning of oral or written communication to recognising that these forms of social practice have pedagogic implications. To clarify them, it is necessary to spell out what Brandom refers to as the 'essential social articulation'[8] of the space of reasons, and to show how this allows him to add a further dimension to McDowell's, and by extension Ilyenkov and Vygotsky's, position in two ways.

The first way is to argue that when we talk about concepts as being places in the space of reasons we are talking about 'things that can in principle be given as reasons, and for which reasons can in principle be asked' (Brandom 1995: 896). To explain what he means Brandom distinguishes between concept use and non-conceptual activity. He asks the following question: what is the difference between a parrot trained to say 'Rawk, that's red' in the presence of red things, a thermostat that turns the furnace on when the temperature drops to sixty degrees, and a human who makes similar responses under similar circumstances. What distinguishes us, according to Brandom (1995: 897), is that we have the concept of colour and temperature which allows us to identify what follows from these observations, what would be reasons for them, what it would entitle one to do, and what would preclude such entitlement.

This leads to the second way in which Brandom supplements McDowell's concept of the space of reasons. He argues that knowing what follows from an utterance, action or an event presupposes 'giving and asking for reasons', and that this constitutes a form of 'practical know-how', that is, being able to:

'tell what would be reasons for and what would be reasons for them - is as much a part of their understanding of 'red' ... as are their reliable differential responses. And it is the *inferential*

[8] By this Brandom (2000) means the way in which participation in social practice provides understanding of the historical constitution of the space of reasons as well as the development of the cultural capability to operate effectively in that space by giving and asking for reasons.

articulation of those responses, the role they play in reasoning, that makes those responsive dispositions to apply *concepts'*.

Brandom 1995: 897)

Concept-use irrespective of its context-of-application, for Brandom (2000: 162), means being able to move thought and/or action in the space of reasons by mediating between differentially elicited responses and situating them in a 'network of inferential relations' that are historically and socially constituted. And in the process to be, as Vygotsky would have expressed this statement, repositioned in relation to events and actions in the natural or social world.

To do this, according to Brandom, we have to be able to distinguish between what other people are talking about (the propositional dimension of thought and talk) and what they are saying about it (the representational dimension of thought and talk)[9]. This distinction is important because it allows us to grasp that it is the interrelation between these different dimensions that allows us to formulate and communicate opinions. Hence Brandom maintains along with Vygotsky and McDowell that concept use has a normative character, in the sense that the employment of concepts in inquiry is governed by norms. And moreover, like Wertsch, he appreciates that communication occurs as a result of the way in which we personalise the norms governing concept use in practical and discursive activity.

The guiding idea behind giving and asking for reasons is, according to Brandom (2000: 165), that we are able in any situation to pick out what is 'propositionally contentful' in spoken or written communications, that is, whatever can serve as both a premise and a conclusion in inference. Stated another way, he is arguing that representations only become meaningful when they are located in the space of

[9] Brandom does not use the term 'proposition' in the Kantian way that informs the thinking of many scientific realists, that is, to convey the impression that we consciously formulate a set of statements or ideas about the world that correspond to a world of which we have knowledge of. In contrast, his use of the

reasons which allows others to draw inferences from them. This observation can be illustrated by returning to the discussion in Chapter 4 of Knorr Cetina's HEP physicists and of Zuboff's managers. The former were primarily engaged in mediating different interpretations of the results of HEP experiments by, to use Brandom's language, picking out propositional relevance and inferring what follows from this within a shared space of reasons. The latter were primarily engaged in mediating symbolic data by picking out what was propositional relevant and inferring what follows from this. In both cases the individuals concerned had to grasp that what is offered as the reason behind an action or thought also stands in need of a reason itself, it was this act of discernment that facilitated communication within and across the space of reasons. Hence placing events or actions in the space of reasons presupposes practical mastery of the 'social practice of giving and asking for reasons' (Brandom 2000:165). It is only when we have mastered this practice that we are able to identify what is a reason for what, and what are good as opposed to bad reasons.

It can be argued that Brandom's insights about the link between the social articulation of the space of reasons and the social practice of giving and asking for reasons helps to clarify a number of issues that were left unresolved in McDowell and by extension in Vygotsky and the post-Vygotksians. The first issue is that Brandom highlight is the form of knowledgeability (his term is 'practical know-how') which we use to mediate between different types of theoretical concepts and between theoretical and everyday knowledge. The primary feature of this knowledgeability is to recognise that what serves as the premises and conclusions of inferences in theoretical or everyday activity, as Brandom (1995: 896) makes clear, are propositional contents because they are the fundamental and defining features of conceptual content. What enables us to infer the typicality or otherwise of an object, activity and so forth is mastery of the social practice of giving and asking for reasons. Hence Brandom reinforces Vygotsky's argument that learning

term is informed by a Hegelian argument that meaning arises inferentially within a system. Hence propositions are formed and tested within the space of concepts and space of reasons.

to acquire and use knowledge is in equal measure an issue about the process and content of learning. Or as Vygotsky (1997a: 133) expressed it The internal side of mediation is revealed in the double function of the sign: (1) communication, (2) generalisation'.

The second issue is that even when we acquire some form of knowledge noninferentially, for example, taking something for granted or being instructed to believe something to be true, with the result that we are unable to justify that knowledge, it still means reason is in play. To be capable of making a claim about something or to even to believe that it, requires, as Brandom, observes:

> 'that we *understand* it: that we have at least a rough practical mastery of its inferential role, the know-how to discriminate some things that follow from it and others that don't, and some things that would be evidence for it and others that would not'.
>
> Brandom (1995: 905)

Thus, Brandom offers a further clarification of McDowell's claim about the unboundedness of the conceptual. He makes it clear that the reason we are able to acquire something noninferentially is because the conceptual has already pervaded the everyday. It is possible to accept a concept such as global warning without having studied the scientific evidence because our wider scientific knowledge and understanding allows us to identify what is propositionally contentful, and to articulate inferentially and socially what does and does not follow from our understanding of those propositions.

In demonstrating the link between communicative social practice and the space of reasons, Brandom adds a further dimension to the philosophical justification Ilyenkov and McDowell provided for Vygotsky's concept of mediation. Brandom helps to make the implicit feature of Vygotsky's position much more explicit by arguing that thinking in concepts means we act and communicate inferentially, that is, they are able to respond differentially to actions, events and thoughts. Responding differentially in his terms means knowing what follows from adopting

a particular position or accepting a specific belief. In this regard, Brandom (2000: 25-6), like McDowell and Vygotsky, is arguing in favour therefore of a 'functional' view of concepts, that is, their role in supporting reasoning by revealing the relations and connections that exist between objects and events, rather than conceiving of the primary feature of concepts as originating in experience.

Despite developing these insights about the social articulation of the space of reasons, there are a number of issues that require further clarification. First, it is possible to misconstrue Brandom's argument about the giving and asking for reasons as though it means he is committed to a form of 'semantic passivity' (Habermas 2000). In other words, that Brandom is primarily concerned with identifying the social practices that facilitate the discovery of pre-existing facts and hence is limiting knowing to a merely receptive process of being informed. Such an interpretation misunderstands Brandom's (2000:357-359) intentions in two senses: first he is not glossing over the important role played by our active intentions in making our own judgements about how things are; and, second, he recognises that we make our concepts. He is not maintaining that we somehow find concepts 'put there' since this would omit a crucial element of our freedom and spontaneity and, in the process, threaten to make unintelligible the crucial notion of 'conceptual development.

Second, despite these important caveats, what appears to be missing from Brandom's work is any engagement with one of the central claims of this thesis; namely that the outcome of mediation varies depending on the purpose of learning or the type of concept used to facilitate reasoning. Translated into the terms of the thesis, the social practice of reasoning within the pedagogy of repositioning, participation and expansion imply access to very different cultural tools and result in very different mediated outcomes. This avoidance of the purpose of mediation is understandable in Brandom's work since as Habermas (2000:322) has acknowledged, Brandom is involved in a substantial piece of theory building in analytical philosophy as opposed to offering a contribution to

contemporary debates about pedagogy. Hence he restricts his discussion of the giving an asking for reasons - to well-bounded situations where it is relatively straightforward to illustrate the relationship between the propositionally contentful and the social practice of inference. This implies that Brandom's ideas about the social practice of reasoning will have to further developed if they are to play the central part the thesis has claimed for them in pedagogy.

Conclusion

The preceding discussion of the pedagogic implications of epistemological issues raised in Chapter Eight has placed the thesis in a position to formulate a pedagogy to go beyond the two worlds of knowledge in education. First, it has established that Ilyenkov and McDowell's arguments about the idealisation and conceptual unboundedness of the world enable us to go beyond the dualism introduced by a number of post-Vygotskians in Chapter Seven. The aforementioned argument helps us to grasp the full implications of Vygotsky's insight that thinking in concepts allows us to appreciate the relation between things in the world, without forcing us to become abstract rationalsists. Specifically, by articulating the social roots of reason, Ilyenkov and McDowell allow us to appreciate that the restructuring of theoretical and everyday concepts presupposes that we can locate our understanding in the space of reasons. Furthermore, Brandom's argument that we can only accomplish such understandings by engaging in a particular forms of social practice - the 'giving and asking for reasons' identified the pedagogic implications of what it means to locate concepts in the space of reasons. What is distinctive about this social practice is that it constitutes a new conception of knowledgeability - knowing what follows from adopting a certain position or accepting a specific belief. The chapter nevertheless acknowledged that this new form of knowledgeability poses different implications for the three pedagogic principles - repositioning, participation and expansion identified in the thesis.

Chapter 10

Beyond the two worlds of knowledge (5): Towards a pedagogy of mediated activity

Introduction

The last chapter considered a number of pedagogic issues arising from the discussion in Chapter 8 of the significance of Ilyenkov and McDowell's ideas about the social basis of reason for overcoming the two worlds of knowledge. It introduced the ideas of Robert Brandom to elucidate the pedagogic implications of recognising that we live in an idealised world and that we can understand that world by locating concepts in the space of reasons. It argued that this involves a new form of knowledgeability – 'the giving and asking for reasons' based on the social practice of establishing inferences. The aim of this chapter is to further elaborate and extend this analysis in order to formulate a pedagogic framework to go beyond the two worlds of knowledge.

The cornerstone of this pedagogy are the three different theories of learning that emerged from the discussion of Vygotsky's concept of mediation in Chapters 6 and 7: the theory of learning 'theoretical concepts', 'situated' learning, and 'expansive' learning. There were two main reasons for focusing on these three theories. First, they each presupposed a specific purpose of learning - learning to 'reposition', to 'participate' and to 'expand', and a specific pedagogic strategy - 'learning actions', 'legitimate peripheral participation' and 'expansive learning', to realise those purposes. Second, it was argued that each purpose and each pedagogic strategy revealed a different aspect of the interdependence between theoretical and everyday concepts in the knowledge economy/society.

The impression conveyed in the post-Vygotskian literature about these theories, purposes and pedagogies is that they are separate and different from one another. In one sense this is obviously true in that they reflect the longstanding tension in CHAT between the idea of semiotic mediation and mediation by activity. In contrast, the thesis has maintained that (to paraphrase Vygotsky's remark about Piaget) in stressing the 'break' between the different purposes of learning and conceptions of pedagogy writers such as Davydov, Engeström, and Lave and Wenger disregard the connections between them. Furthermore, it has also been maintained that a rather different picture emerges when these theories of learning are interpreted in relation to Ilyenkov and McDowell's ideas about the social basis of reason and Brandom's ideas about the social practice of drawing inferences through reasoning. Their work allows us to appreciate the difference and the connection between the three purposes of learning and to consider the pedagogic implications of those connections.

To recap briefly, the following interconnected argument has been made. The transformation of nature by human action results in an idealised world, that is, meaning and value are written into the natural and social world. One consequence of this idealisation is that the world offers us reasons for how and why things are; hence it provides a normative context - the space of reasons within which we assess the respective explanatory merits of theoretical and everyday concepts. Operating in the space of reasons presupposes that we can see which aspects of the world a theoretical concept has brought closer into view and which aspects the concept hides. It is also presupposed that we can identify the process of conceptual restructuring which occurs as we mediate theoretical and everyday concepts and vice versa and the concomitant change in our ideas and social practice which takes place as a result of that mediation. It is only when we understand the connections between concepts and practice that we can appreciate there is not necessarily an unbridgeable gap between the two worlds of knowledge.

The thesis has argued that we are able to understand the connection between concepts and practice as we engage in the social practice of 'giving and asking for reasons'. This social practice presupposes conceiving of theoretical concepts as serving a functional role in facilitating reasoning in different contexts, rather than as serving as representations of an objective world as scientific realists claim or as pictures of our mental image of the world as postmodernists claim. Once we conceive of theoretical concepts as cultural tools to facilitate our reasoning it becomes possible to make intelligible, reasonable and rational judgements about the natural and social world.

Chapter 10 maintains that the preceding argument provides the basis for a social theory of pedagogy which the chapter refers to as the *pedagogy of mediated activity*. The first and foremost assumption on which this conception of pedagogy rests is that we have a mediated relationship with the world. The second assumption is an acceptance of the social basis of reason. The third assumption is that learning presupposes the social practice of the 'giving and asking for reasons'. The chapter uses these assumptions to reconceptualise the different purposes of learning that Vygotsky, Lave and Wenger and Engeström introduced and, simultaneously, to further elaborate the implications of Brandom's ideas about the social practice of reasoning. It then concludes by articulating the principles and practices of the pedagogy of mediated activity which it maintains allows us to go beyond the two-worlds of knowledge and to address the epistemological challenges presented by the knowledge economy.

Towards a pedagogy of mediated activity

The pedagogy of repositioning

The discussion of the first strand of the pedagogy of mediated activity starts with the claim based on our interpretation of Vygotsky, that when we learn theoretical concepts we are repositioned to act differently in the world. The primary reason for this starting point is to reflect the order in which the three ideas of learning - 'reposition', 'participate' or 'expand' were discussed.

There are two different senses in which theoretical concepts can reposition us to act differently in the world. The first sense in which we are repositioned arises from our discovery that we can identify that givenness is a variable feature of the world. Theoretical concepts allow us to see the connections and relations between things that otherwise appear to sensory perception to be free-standing objects or events. In so doing, they also offer us cultural tools to grasp the way our activity idealises aspects of the world.

Grasping connections is only possible, according to Vygotsky, when we understand the generalisation that is contained within a theoretical concept. The essence of such generalisations is not, as postmodernists and post-Vygotskians such as Wertsch, maintain, an idealised abstraction from the world. Rather it is:

> 'the enrichment of the reality that it represents, in the enrichment of what is given in immediate sensual perception and contemplation. However, this enrichment of the immediate perception of reality by generalisation can only occur if complex connections, dependencies, and relationships are established between the objects represented in concepts and the rest of reality. By its very nature, each concept presupposes the presence of certain systems of concepts. Outside such a system, it cannot exist'.
>
> Vygotsky (1997: 224)

The way in which we grasp the generalisation contained within a theoretical concept was outlined by Vygotsky (1987: 226) schematically and metaphorically through reference to the notion of the 'longitude' and 'latitude' of concepts. The gist of his argument was that we use the relationship of generality within any given concept to locate it vertically in relation to other concepts and to locate it horizontally to understand aspects of the world.

Grasping connections, however, presupposes that we think in theoretically informed ways, as Davydov argued, by explicitly formulating the object and motive of learning to help us to identify the measure of generality contained within a theoretical concept, and to use that generalisation to bring aspects of our relationship within the world more closely into focus. For example, when

we can identify the measure of generality contained within, for example, the concept of mediation, we are able to grasp the dialectical relationship between the content, pedagogy, resources and environment of learning. This Davydovian idea is an advance over conceiving of mediation as an empirical concept; that is, to assume that the concept is merely drawing attention to the influence of a range of disparate factors (i.e. tools and context) on learning.

The challenge of devising a pedagogic approach to reposition us to think in theoretically informed ways was, as we saw in Chapter 7, taken forward by Davydov with his cycle of learning actions. Translated into the terms of the thesis, the cycle allows us to locate concepts within the 'space of concepts' and allows our thought to move in the 'space of reasons'. The cornerstone of the cycle was to ensure that we identified the primary general relationship - the kernel concept in any field being studied. This goal was achieved by providing us with learning tasks that can be resolved through the application of the kernel concept and, in the process, consolidating our understanding of the concept and its potential application in a number of situations.

In making this argument, Davydov extended and elaborated our understanding of Vygotsky's concept of the zone of proximal development by highlighting what it might mean to say that thought is moving in a zone that facilitates theoretical thinking. Moreover, Davydov also indicated that kernel concepts constituted, in principle, criteria that educators could use to inform the design of curricula. The tricky question is which kernel concepts should be selected to help orientate us to detect the hidden relations in any field of study. This proposal remains suggestive rather than substantive in Davydov's work since he does not offer any clues as regards how to select the appropriate kernel concept (Young 2003: 110-1).

It is nevertheless possible to infer from Davydov's comments two criteria that we could use to identify kernel concepts. The first criterion is to consider the

historicity[1] of the development of knowledge. This suggests that the decision about which kernel concepts are selected has to take into account the key developments in debates about the development of knowledge in any given field. This stands in stark contrast to the claims advanced, as we saw in Chapter Six, by 'neo-conservatives' that university curricula should be based on traditional texts, by 'technical-instrumentalists' that the curriculum should be skills-based and by 'postmodernists' that curricula should be constructed on the basis of our preferences. The second criterion arises from Davydov's argument that the distinctive feature of kernel concepts is that they enable us to analyse problems within disciplines as an instance of a general relationship. This suggests that kernel concepts have a 'compelling character', in other words, it is possible to identify their pivotal role in the development so far or potential development of knowledge within any given field (Young 2003: 10-11)[2]. It is my contention that, taken together, it is possible to use these criteria to select kernel concepts from within disciplinary fields, and to justify their inclusion in the curriculum as concepts that will help us to disclose the system of mediating links and connections that shape the world.

The primary purpose of building a curriculum around kernel concepts is to give us a sense of the world that we cannot acquire unless the connections between concepts are stressed, and that we cannot generate from everyday experience. So in contradistinction to the 'utilitarian' and 'postmodernists' who advocate responding to the knowledge economy by fracturing (university) curricula into 'bite-size chunks' of information that can be endlessly combined, translated into one another and accredited, Davydov's approach is based on a radically different stance. The purpose of the curriculum is to enable us, to borrow Young's (1999: 474) term to 'connect' theoretical concepts to one another and to the everyday world, and not to just furnish us with information.

[1] I take it from his brief remarks that Davydov (1988: 310) is adopting an Hegelian conception of the historicity of kernel concepts. By this I mean that, he assumes that it is possible to trace the way in which kernel concepts in any field develop in response to the insufficiencies of earlier concepts. This position does not deny that concepts can have a multitude of histories once they have been developed.

[2] Young (2003) makes the opposite argument. I would maintain however that once we concentrate on the substantive case for kernel concepts (i.e. their centrality to the development of a discipline) rather than the methodological case that Davydov advances as regards their characteristics, it is possible to formulate criteria to identify kernel concepts.

The impression conveyed by Davydov, however, is that providing we follow the six steps of his cycle of learning actions it is possible to learn all the known applications and even extensions of a kernel concept. It is as though they are coiled up inside the kernel like a spring constituting 'rails' along which our thought can run, and just waiting to be released as we move through each successive stage of the cycle of learning actions. This plays down the extent to which kernel concepts are themselves embedded in disciplinary and pedagogic practice and introduces a slightly over-deterministic account of the development of theoretical thinking and an over-instrumental view of the cycle itself (Guile and Young 2003: 74). The implications of this observation will be returned to after the second sense, in which individuals are repositioned through learning theoretical concepts, has been discussed.

The second form of repositioning arises as we begin to construct our understanding of theoretical concepts upon the foundation provided by our existing everyday or theoretical concepts. This results in a process of conceptual restructuring because, as Vygotsky acknowledged, when we learn a new theoretical concept it never wholly nullifies our existing concepts; in contrast, it results in those concepts 'acquiring whole series of new relationships' with the new concept (Vygotsky 1987: 223).

Once again the idea that existing concepts acquire a whole series of new relationships' with new concepts is only outlined very schematically by Vygotsky. It is possible, however, to construct from some of the diverse references to concept formation in his work a clearer understanding of what he had in mind[3]. First, Vygotsky (1998: 56) acknowledged that although educators normally endeavour to teach concepts in their 'pure' form, that is, to describe their main features and relationships, we do not assimilate them in this form nor do we reason with them in this form. This is because our interpretation of a theoretical concept is mediated by our prior concepts, thereby affecting the way

[3] My argument is based on a number of observations Vygotsky makes in Chapter 6 of *Thinking and Speech* (1997L240-1), the implications of which he acknowledged he had not fully realised.

in which we come to understand and use theoretical concepts. Second, to take an example central to our argument, Vygotsky highlighted that the way in which we understand the measure of generality contained within a theoretical concept such as mediation determines the set of possible operations for how we use the concept in theoretical discourse (Vygotsky 1997: 228). It also shapes the extent to which our existing everyday concepts such as 'learn-by-doing' are restructured by the concept of mediation, enabling the former to be used in a new and more encompassing way. Third, Vygotsky argued that even when theoretical concepts are built on the foundation provided by other theoretical concepts, our understanding of generalisations is:

'partial because each new stage of generalisation emerges from the generalisation that was generalised in the previous structure of objects. It arises as a generalisation of generalisations, not as a new mode of generalisation of isolated objects. The result of previous efforts of thought which are expressed in generalisation that dominate the previous states do not come to naught. They are included in the new work of thought. They are the prerequisites for it'.

Vygotsky 91987:229)

This means there is always a sense of provisionality as regards our use in the social practice of reasoning of the generalisation contained in a theoretical concept because our understanding is mediated by our prior concepts. Our understanding, for example, of the theoretical concept 'cognition' or the everyday concept 'learning-by-doing' mediates our understanding of the theoretical concept 'mediation'.

These observations about the mediation of theoretical and everyday concepts introduce a different dynamic into Davydov's claims about the development of theoretical thinking. Instead of seeing theoretical thought as the automatic outcome of working through the cycle of learning actions, Vygotsky highlights that the development of theoretical thinking is mediated by the extent of the restructuring that occurs between theoretical and other theoretical, and theoretical and everyday concepts. Thus, Vygotsky is not claiming that theoretical concepts and thinking completely displace everyday concepts and thinking. He is offering a much more nuanced account of concept formation

which acknowledges that our existing beliefs, irrespective of their basis, mediate our understanding of a concept, the extent of our conceptual restructuring and the way we operate within the space of reasons.

These insights, which are central to the pedagogy of repositioning, are completely foreign to 'pedagogies of reflection' and, moreover, do not appear to have been addressed in CHAT. In the case of the former, the legacy of the 'representational paradigm', as we saw in Chapter 5, simply perpetuates the two-worlds of knowledge. In the case of Activity Theory, Davydov concentrated on how we learn theoretical concepts, Lave and Wenger and Wertsch rejected the distinction between theoretical and everyday concepts while Engeström was concerned with the formation of new types of theoretical concepts from the contradictions in everyday life.

To understand fully the pedagogic implications of the restructuring of theoretical and everyday concepts, it is necessary to return to Brandom's ideas about the social practice of reasoning. One of the distinguishing features of human activity is, as Brandom (2000: 157) observes, that we explain thought and behaviour by attributing them to 'intentional states such as belief and desire as constituting reasons for that behaviour'. This means that, from his perspective, the process of conceptual restructuring occurs as we attempt to understand the thought of others and attempt to avoid sliding into a kind of self-undermining relativism. For this to happen, it is necessary to strive towards establishing 'a non-question-begging account' of why certain reasons are the authoritative reasons for accepting the explanation offered by a theoretical concept (Pinkard 1996: 5).

Understanding the thought of others, as we saw in Chapter 9, presupposes that we can grasp what they are thinking or talking about and what they are thinking or saying about it. The former constitutes, in accordance with Brandom's definition, the propositional dimension of thought and talk, the latter its representational dimension. Moreover, it is only possible to

understand the representational dimension of propositional contents in terms of their social articulation when, as Brandom (2000: 159) observes, we:

> appreciate that the context within which concern with what is thought and talked about arises is the assessment of how the judgement of one individual can serve as reasons for another'.

These observations suggest that the process of conceptual restructuring can only occur as we make thought and behaviour intelligible and for this to happen, according to Brandom, we have to accept that we act for reasons. Acting for reasons, as was argued in Chapter 9, presupposes a 'space' in which thought moves, and the idea of thought moving presupposes the restructuring of theoretical and everyday concepts.

These observations about the link between reason and concept formation help to make explicit the centrality of the social practice of giving and asking for reasons for the pedagogy of repositioning. Our everyday concepts are not restructured merely through coming into contact with theoretical concepts nor are our existing theoretical concepts restructured through coming into contact with other theoretical concepts. Restructuring occurs as we assess whether we chose to or not to revise a previously held belief or an aspect of our goal-orientated activity.

The social practice which allows us to count some kinds of things as evidence to confirm the truth of a theory or the validity of a concept rests on, according to Brandom (2000: 167-8), the following three assumptions[4]. The first assumption is that in attributing an 'inferentially articulated, hence propositionally contentful, commitment' towards a theory or concept, we are able to discern the basis of the theory and why this might be true. The second assumption is that in attributing 'a sort of inferential entitlement to that commitment' we are able to articulate the justification for the theory. The third assumption is that in accepting the validity of a theory by endorsing the principle of commitment and entitlement, we are able to realise what the commitment entitles us to infer

[4] For a full account of Brandom's views see *Making It Explicit* (1994).

and moreover what follows from that inference. Thus, it can be argued that, in essence, Brandom is maintaining that the process of conceptual restructuring is influenced by how far we actively use the procedures and techniques of reasoning to mediate the relation between different types of concepts.

These observations about the social practice of reasoning highlight that our understanding of a new concept is shaped by the way we use the procedures and techniques of reasoning to assess a concept's validity and relevance. For example, our actions and thoughts are not transformed through merely learning the word that embodies the meaning of a kernel concept such as mediation nor do we use a kernel concept in some routinised way to identify its diverse developmental forms and manifestations. Our understanding of a kernel concept is completed and formed as we use it to reason in our writing, in our conversation, in our inner speech and in our practical activity.

Brandom, however, does not completely provide an answer to the problem with which Davydov left us. The development of theoretical thinking is never quite as prescribed as Davydov or Brandom, in their different ways, imply because repositioning is a multifaceted not a unidirectional process. This is partly because as we learn a theoretical concept a whole series of new relationships are opened up between that theoretical concept and our existing theoretical and everyday concepts and these relationships have implications for our social practice. The relationships lie on a continuum from a restructuring of our views and a concomitant change in our social practice through to contesting the authoritative basis of a theoretical concept. Paradoxically, although he maintains a very different view about theoretical concepts compared to Brandom and Davydov and Vygotsky, Wertsch helps us to understand why learning theoretical concepts opens up a whole series of new relationships with other everyday concepts, and moreover to identify the pedagogic implications of this development.

In common with Vygotsky, Wertsch acceptes that the relation between thought and word is a living process not an automatic one, in the sense that there are no

preformed, orderly and constant relations between thoughts and words. This relation is formed and developed as we attempt to express thoughts, for example, as we write or talk or as part of our inner speech. We negotiate, as Wertsch observes, the ordering of our observations in a way which reflects our beliefs, and which is also responsive to the concerns of others. In common with Brandom, Wertsch acknowledges that the process of negotiation is dependent upon us responding to an observation by taking into account the context into which our reply has to be directed.

Nevertheless, unlike Brandom whose notion of 'commitments' and 'entitlements' rests on a fairly formalistic conception of the process of semiotic mediation, Wertsch highlights the multifaceted way in which we use language to mediate our understanding of concepts. The Baktinian influence on his thinking leads Wertsch to draw attention to the way we use language to engage 'dialogically' with audiences and establish the meaning of concepts through the often contested process of communication. This is an impossible goal to achieve as the discussion on Wertsch has argued if we conceive of communication in terms of the 'conduit' metaphor and assume meaning is transparent. Or, if we follow the 'pedagogies of reflection' and assume that we can 'mentalistically' establish a link between concepts and the world.

In contrast, the thesis has argued that we develop the ability to locate theoretical concepts in the 'space of reasons' as we engage in the social practice of giving and asking for reasons. Engaging in this social practice, however, does not mean that when we learn a theoretical concept we are automatically repositioned in relation to objects, activity and the world. For this to happen, according to Wertsch, we have to personalise our understanding of the concept by using it in different 'spheres of communication' to convince members of those communities about the significance of the argument we are making by speaking within the accepted idiom.

Thus, Wertsch acknowledges implicitly that the social practice of giving and asking for reasons is rather different in speech genres where discourse involves

the use of theoretical concepts as opposed to everyday concepts. The former involves framing arguments based on good reasons for accepting theoretical concepts which are consistent with (or even which challenge) the space of reasons that facilitates the movement of thought in a specialist (Goodwin 1994) or multidisciplinary community (Hall *et al.* 2003). In contrast, the latter involves framing arguments in relation to shared understandings about events, activity and the world (Lave 1988). Wertsch is not overly concerned about the difference between the different types of reasoning involved in these distinctively different social practices. This is partly because he rejects the distinction between theoretical and everyday concepts and partly because his theory of mediated action is more concerned, to borrow Shotter's (1993: 383) term with the 'addressivity' and 'responsivity rather than the 'answerability' of speech positions. The idea of the answerability of speech positions presupposes being able to give good, in other words, 'authoritative reasons'[5] why for example, the theoretical concept of mediation offers us a greater range of inferences than, for example, the concept of learning-by-doing, hence why it can be used to overcome the two-worlds of knowledge in a way that the latter concept cannot.

The idea of authoritative reasons is a necessary development from Brandom because it reminds us, as Pinkard (1995; 5) obserrves, that we require some way to evaluate:

'what kinds of reasons for belief (or for action) can count as *authoritative* reasons and .. to show that the reasons given for counting those reasons as authoritative are *themselves* authoritative'.

This emphasis on authoritative reason presupposes the existence of 'groundrules' to justify our beliefs and to guide our actions (Pinkard 1996: 8)[6]. The ground rules for reason-giving are not, as Wertsch implies, constituted

[5] This term comes from Pinkard's (1996) discussion of Hegel's idea about the sociality of reason. The reason I have used it to elucidate the implication of Shotter's argument is as follows. Shotter is discussing the similarity between Bakhtin and Vygotsky's conception of the role of language in reasoning and the Hegelian provenance of the former writers is widely accepted (Derry 2003).

[6] Pinkard (1996:8) uses the term the 'social space' instead of the 'space of reasons' It is my contention however that the former term conveys the same meaning as the latter. For the sake of consistency, I have chosen to use the latter term.

afresh every time we engage in dialogue with other people. Rather reason-giving occurs, as Pinkard (1996: 8) observes, within a space of reasons that 'licenses' some kinds of inferences and fails to 'license' others'. It is the structure of authoritative reasons that allows us to appreciate that the way we reason is not just how we contingently happen to reason but rather the way in which we 'should reason' in general. This is because there are sets of authoritative reasons 'that appear as both certain and as structuring what is to count as truth, and as necessary, as something that is not optional for the kinds of agents we are' (Pinkard 1996:8).

This means that the aim of the pedagogy of repositioning is not to encourage us to reject a concept simply because it is possible to show that it is deficient in respect of some aspect or another. Rather, we reject a concept when the identified deficiencies, to paraphrase Pinkard (1996: 10) 'lead to' the kind of account that another concept provides. For this to happen, the former has to appear to be self-undermining to the extent that there is indeed some aspect operative in the concept that reveals its failure to make good on the terms that was set for it (Pinkard 1996: 8).

These observations about the link between ground-rules, reason-giving and the space of reasons help us to tie together a number of lines of the preceding argument that are central to the pedagogy of repositioning. The first one is that if we are to think in theoretically informed ways, then we have to formulate the purpose and motive of learning so that we engage in the social practice of reasoning with theoretical concepts. This social practice allows us to clarify what does and does not follow from different theoretical concepts. The second one is that if we are to devise a curriculum that conceives of theoretical concepts as putting us in touch with the world, then we have to locate the generalisation contained in a theoretical concept in the space of reasons. This social practice allows others to draw inferences from our use of that generalisation and to articulate what does and does not follow from our use of it. The third one is that if we accept that the drawing of inferences from a theoretical concept is a multifaceted process, then we have to be able to identify the system of

mediating links between the concepts. This social practice enables us to engage critically with the authoritative reasons that others present to justify their argument by drawing on more than one concept to reveal the failure of the argument to make good on the terms that it set for itself.

The final line of argument is that the social practice of reasoning does not imply a purely contemplative stance as regards the relationship between our ideas and our activity in the world. Far from it; the concepts of idealisation and conceptualisation offer us a way to understand why ideas and activity are even more intertwined in the knowledge economy than in previous types of economies. And, depending on how we use this knowledge, we are in a better position to identify and assess different options for how we want to respond to the challenges the knowledge economy presents. This means that our ability to reason and communicate is not only, as Leont'ev acknowledged, an intrinsic part of our 'goal orientated activity', but also provides us with the resources to question the givenness of our participation in the world. This observation serves as the link to the second strand of the pedagogy of mediated activity and involves a reconceptualisation of Lave and Wenger's ideas about the situated basis of learning.

The pedagogy of participation

The cornerstone of Lave and Wenger's argument about the situated basis of learning is that that participation constitutes an epistemological principle of learning. This statement reflects their argument that any situation provides, in principle, an opportunity for us to 'learn' inter-subjectively so long as a number of pedagogic conditions support participation (i.e. legitimate peripheral participation, learning curriculum). These conditions allow us to move through the first zone of proximal development we encounter and become an experienced member of a community of practice. Furthermore, once we focus on the inter-subjective basis of human activity it is possible, according to Lave and Wenger, to overcome the gap between mind and world, and to appreciate that the distinction between theoretical and everyday concepts is a folk dichotomy.

The link that the thesis is claiming exists between the pedagogy of repositioning and participation, however, necessitates a re-thinking of the theoretical and pedagogic conclusions Lave and Wenger drew about practice and participation. Following Vygotsky, Ilyenkov and McDowell, the thesis has argued that our activity, mediated by theoretical and everyday concepts, shapes the external environment in such a way that it constitutes a domain of meaning which offers us reasons for our beliefs and actions. Hence it rejects the claim that the distinction between theoretical and everyday concepts perpetuates a folk dichotomy. In contrast, it argues that to understand, the idealised' and 'conceptualised' basis of practice, especially in the knowledge economy where knowledge cultures and processes are constantly spilling out into economic and cultural activity, we have to develop something akin, to what Hedegaard (1998:1170 referred to as, a 'reflective goal' for practice[7]. That is, we need to examine critically whether the goals and authoritative reasons for the organisation of social practice are self-undermining on the terms set for them. This implies the use of theoretical concepts that lie beyond the immediate context and thus it is a very different approach from the 'pedagogies of reflection' discussed in Chapter 5.

It is impossible to scrutinise critically practice if we rely solely on Lave and Wenger's idea that pedagogy is an implicit feature of participation because the theories, artefacts and bodies of expertise that constitute the special and distinctive domain of competence for different social practices are rarely transparent (Goodwin 1994: 29). First, they are embedded in the discourses and the classification systems employed to organise and structure professional or technical practices (Bowker and Star 2000) as well as in the managerial philosophies that shape the deployment of technology and the development of knowledge and skill (Zuboff 1988). Second, the way in which theories, artefacts and bodies of expertise are used, as Leont'ev pointed out, has often become routinised or habituated such that we often experience

difficulty when trying to articulate the guiding principles of an aspect of practice. These observations about the embeddedness and/or the inscription of ideas in practice and the difficulty we experience when trying of articulate practice, suggest that, what Vygotsky referred as, 'articulated speech' (i.e. dialogue and/or conversation) is more central to participation than Lave and Wenger acknowledged in two senses. We use dialogue and/or conversation to make the reasons for the organisation of social practice visible and explicit and to work collaboratively with others to evolve social practice.

The conventional psychological wisdom in the early twentieth century was that there was little connection between the use of material tools, for example, a knife, a pen and so forth in practical operations and dialogue and/or conversation. Historically, the relationship between dialogue and/or conversation and tool use was at best considered, as Vygotsky (1999: 23) remarked, as 'something that accompanied operations, like an accompaniment that goes with a melody line'. The firm emphasis in Lave and Wenger's work on 'learning to talk as though one is a member of a community of practice' can be interpreted as a recent, albeit implicit, endorsement of that position[8]. In contrast, Vygotsky argued, as we saw in Chapter 6, that the development from inner to articulated speech enables us to exercise greater control over our cognitive and practical actions. The former allows us to formulate options for action while the latter enables us to share our formulations with others and to amend and to revise them in light of feedback.

The growing interest among psychologists and socio-linguists in the late twentieth century in the concept of the 'social' (Van der Veer and Valsiner 2001) 'mediated' (Nelson 1995) or 'embodied' (Lakoff and Johnson 1999) mind has resulted in a reappraisal of the link between dialogue and practical action.

[7] They also allow a number of new dimensions to be added as well as to the way the term practice has often been discussed elsewhere in Activity Theory (Nardi 1996; Rogoff 1995) and elsewhere in Socio-Cultural Psychology (Billett 2003).

[8] It is important to note that Lave gives more emphasis to the relation between discourse and social practice in *Cognition in Practice* (1988) than she does with Wenger in *Situated Learning*(1991), yet, it is the latter book that is explicitly about learning in practice.

Vygotsky's argument that the different forms of speech which he identified play an organising role in our use of material and symbolic (i.e. theoretical concepts) tools has gained increasing prominence[9]. Dialogue and/or conversation are increasingly recognised as an inseparable and internally necessary part of accomplishing fairly simple as much as complex activities. We use our inner and articulated speech to select the tools we want to use and also to guide our own behaviour, actions and intentions and to explain the reasons which informed those choices to others (Sfard 2001).

The introduction of material or symbolic tools that are not within our direct or peripheral field of vision or awareness to solve a problem is, in other words, not merely a matter of intuition or chance. Our decisions are mediated by our knowledge of those tools based on our ability to name them and infer what might follow from using them. This leads us to assess their relative contribution to the task in hand of generating working hypotheses about how to solve the problem in hand and any additional tools that may be required to solve that problem and, moreover, paves the way for solving future problems.

This prospective dimension of using material and symbolic tools presupposes that we can overcome the way in which tools are embedded in particular forms of social practice and in speech genres to use them in other situations (Edwards 2004). This is tricky because sometimes practice and discourses are mediated explicitly by the theoretical concepts and presuppositions that are part and parcel of the special and distinctive domain of professional competence (Goodwin 1994: 29). Sometimes they are mediated by professionals combining disparate phenomena, including dialogue, artefacts and inscriptions, to analyse problems and draw inferences from that analysis to communicate with colleagues from different domains of professional expertise (Hall *et al.* 2003: 204). On other occasions, discourse is mediated

[9] Language is deemed to play a very different role in the formation of mind in each of these conceptions of the relation between mind and action. My point is that despite their differences the three arguments about the 'social', 'mediated' and 'embodied' mind all accept that language plays an

'invisibly' by the ubiquitous classification systems (ways of segmenting things) and their associated standards (procedures for how to do things) that are embedded in 'working infrastructures' that constitute the context for professional activity (Bowker and Star 2000:147).

The first step in coming to terms with these densely and differentially saturated worlds is learning to infer what follows when we encounter them. The real insight which emerges from Lave and Wenger's conception of practice is that the ability to 'see' relevant entities and by extension to understand discourse is not solely lodged in the individual mind, but instead within a community of practitioners and their 'technologies of practice'. What is deceptive about this insight is that it leaves us with an undifferentiated conception of practice and of the technologies of practice. We are left with no sense of the different forms of specialised knowledge required to be accepted within different communities of practice, the relation between theory and practice or the difference between craft technologies and information and communication technology.

These are significant oversights, they not only play down the qualitative differences between the specialist knowledge required to participate in their respective practices, for example, of a doctor compared to a nurse, they also play down the qualitative differences in the respective zones of proximal development through which they move. Furthermore, they also elide the way in which access to different types of technologies, for example, craft technologies such as lathes and modern technologies such as computers are influenced by the extent of education and training, cultural traditions in the workplace and managerial considerations (Zuboff 1988). The significance of these observations will be returned to later. The other way that Lave and Wenger's insight about seeing practice is deceptive is that it assumes that the reasons for using specific tools within communities of practice is pre-given within a community. Thus, they overlook that we build and communicate our

organising role in the use of cultural tools, the manipulation of classification and coding systems and so forth.

understanding of practice and tool use as we accomplish different tasks and reflect dialogically in conversation on the purpose of the tasks (Sfard 2001: 29). In doing so, we are moving through a more complex zone of proximal development than is implied by Lave and Wenger's notion of participation.

The second step is learning, to use Wertsch's term, to 'appropriate' the material and symbolic tools that we either encounter or that are made visible to us in different social practices so that they may serve new purposes. And learning, to use Brandom's term, to infer what follows from this proposed new use of such tools. This issue does not surface in Lave and Wenger's analysis of situated learning because the stable and well-bounded communities they analysed contained all the necessary human and technological resources. Nevertheless, one of the increasing challenges of the knowledge economy, as Chapter 4 made clear, is for intra-and inter-professional collaboration. The conventional wisdom about these modes of professional collaboration either assumes that professionals need to reach the same understanding, including embodied forms of perception and action, to work collaboratively or that professionals fail to do so because they do not see the problem in the same way as one another. Hence they are unable to appreciate the complementary nature of their expertise (Hall *et al.* 2002: 204).

These assumptions about the reasons for the success or failure of inter-professional collaboration contrast starkly with emerging evidence about such activity. Hall and colleagues (2002: 205) argue that successful collaboration is not necessarily facilitated by the above development of shared inter-professional understanding nor do conflicts and breakdowns in social practice occur due to a lack of understanding. Instead conflicts are more likely to arise when professional-specific perception and action threatens to destabilise the existing practices of another profession. Successful professional practice can be attributed, according to Hall and colleagues (2002: 205), to the readiness of one group of professionals to appropriate, what they refer to as, the 'representational devices', for example, maps, charts, sketches or scripts that other professionals use to help them to animate situations. It can be

argued that this act of appropriation constitutes a partial form of conceptual restructuring which enables groups of professionals to draw inferences to advance understanding and practice without having necessarily grasped the meaning of those devices for another group of professionals (Hall *et al.* 2002: 206)[10].

These observations about inter-professional activity reinforce Vygotsky's argument about the link between inner and outer speech, reasons and the development of expertise in a number of senses. We use conversation and dialogue to help us to manage and plan our own actions, identify which tools can help us to accomplish those actions, and recognise that the realisation of our plans is often contingent on the actions of others. We also use conversation and dialogue to stabilise the multifaceted possibilities for meaning and action between one another. Furthermore, we use conversation and dialogue to ascertain whether we need to introduce tools that lie outside the spatial and temporal boundaries of a community of practice to resolve the problem in hand.

The relation between reasons and practice is a complex issue. Sometimes the reasons for aspects of practice can be communicated implicitly as part and parcel of goal directed action because practice itself is fairly straightforward. For example, the minimal instructions given to Lave and Wenger's tailors' apprentices to indicate the way in which cloth should be cut may allow the apprentices to infer why this is the case. At first sight, this example may appear to confirm Lave and Wenger's contention that the continuity and evolution of knowledge within a community of practice involves a single general procedure - participation even though it may result in tensions between 'old timers' and 'newcomers'. What is excluded from this conception of participation is that understanding the reasons for practice presupposes

[10] Hall and colleagues (2002) tend to rely on the representational paradigm to justify their argument about the contribution that the 'representational infrastructure' makes to inter-professional collaboration. It is my contention based on my interpretation of the evidence that Hall and colleagues present, that it is not professionals' use of the representations as such but their ability to infer what follows from their appropriation of those representations that allows them to communicate and advance social practice.

that we can personalise them and form our own generalisations to regulate and evolve our participation in practice (Arievitch 2004: 284).

One way to form generalisations about practice so that we can infer what may follow and why in a specific situation, is to engage in what Beach (2003:40) refers to as 'knowledge propagation'. We form this type of generalisation by connecting what we learn from multiple interrelated processes of participation to one another. Beach *et al.* (2003) illustrates the extent of and the demands of 'boundary crossing' through discussing the initial formation of expertise by apprentice electricians and police cadets. The first process is being inducted into current electrical and policing workplace practices. The second process is to become a college student and to become familiar with the historic constitution of practice, the current codebooks that guide practice and to work towards qualifying examinations (Beach *et al* 2003). The third process is to learn to reconcile tensions between the guidance for practice offered in official manuals or from more experienced colleagues compared to the required forms of *in situ* flexibility. The fourth process is to develop a professional style informed by ideas gleaned from these different practices.

The cumulative effect of engaging in these processes provides a way for the apprentice electricians and police cadets to go beyond the givenness of practice and to develop some professional autonomy. They personalise their practice, as Beach makes clear, by forming generalisations to guide their goal-orientated activity as well as revising generalisations and practice over time. One of the main forms of these initial generalisations tend to take is an attempt to find 'similarity across contexts' and 'greater connections between contexts' to establish identity and to guide performance in the work role (Beach *et al.* 2003). The generalisations offered to the electricians and police serve as reasons to guide their actions to resolve types of problems; for example, deciding whether to respond to incidents in a conventional or flexible way, deciding how to mediate the knowledge accumulated from listening to more experienced people in relation to their own experiences, and

deciding how to review and justify their actions to others. The inclusion of the generalisations as an active component in their practice changed the space of reasons in which the electricians or police officers operated by enlargening the scope for their actions. The electricians and police cadets are no longer treating incidents as though they were a series of sense impressions that had to be mediated afresh every time, they used generalisations to guide their perceptions and actions.

This conception of forming generalisations, however, does not completely provide an answer to the problem about the link between dialogue/conversation and practice with which Lave and Wenger left us with for the following reasons. First, although Beach's idea that we personalise practice by forming generalisations extends Lave and Wenger's conception of participation, the generalisations appear, from Beach's descriptions to be based on what Vygotsky and Davydov referred to as, the 'abstractions of traits'. Stated another way, the generalisations are formed through a process of selecting typical features of situations in an attempt to make connections between the incidents which we have already encountered and similar incidents which we may encounter in the future[11]. The second reason follows from the first. This approach to generalisation perpetuates the idea that the theoretical concepts encountered in books or through formal education are either 'folk dichotomies' or 'empty abstracts'; that is, they are an exceedingly poor way to represent reality since they have little relation to the everyday world (Vygotsky 1998: 53). The perceived irrelevance of theoretical concepts for practice is confirmed by Beach (2003) in his observation that the police cadets tended to deny the knowledge provided by police academy was relevant for their 'real work'. It was, nevertheless, apparent to him that such concepts provided the cadets with a frame that they used to guide their practice.

[11] This approach to generalisation is similar to other accounts of the development and use of workplace generalisation (Orr 1996). It implicitly rests on the idea that there is a world external to activity or social practice which can we can represent through a generalisation; the strength of the resulting generalisation being taken to be that it is saturated in the concrete and hence not removed from reality.

To understand why the cadets failed to appreciate the way in which the concepts acquired from the police academy had influenced their operational practice, it is necessary to return to Vygotsky's discussion of the restructuring of theoretical and everyday concepts. Vygotsky demonstrated that our understanding of a theoretical concept is built upon our existing everyday concepts and that theoretical concepts never completely nullify the everyday concepts upon which they are built. Now the concepts the cadets acquired from the academy are unlikely to be theoretical concepts in the sense that Vygotsky and Davydov defined; they are more likely to be what Davydov called 'empirically-based' theoretical concepts because of the enduring influence of empiricist epistemology on professional curricula. It is my contention, however, that it still possible to use Vygotsky's explanation of conceptual restructuring to explain why the cadets rejected them.

Once theoretical concepts and everyday concepts are viewed as separate and different from one another, it is hard for us to appreciate there interdependence. Hence it is difficult to identify the way in which the process of conceptual restructuring has expanded the scope of our understanding and the possibilities for our practice. This is partly because we continue to assume that theoretical concepts are abstractions from the world, rather than cultural tools that may be expressed in abstract terms but which nonetheless put us in contact with the world. This leads us to deny that theoretical concepts have any relation to practice, and to overlook the way in which our understanding of the generalisation contained in a theoretical concept mediates both our understanding of practice and our goal-orientated activity in the world.

In the context of the knowledge economy, however, it is vital as has been argued, to examine critically practice by identifying the idealised and conceptualised basis of practice. It is not possible to do this if we maintain Lave and Wenger's conception of participation which restricts the focus of analysis to the conceptions that communities of practice have about the tasks or situations in which they are engaged (Edwards 2004). This focus excludes

any consideration of what made the community act and form the goals that practice is designed to realise in the first place, let alone any consideration of what might make communities strive for something beyond the existing form of practice. This does not mean that we should no longer continue to explore the way in which different 'reportoires' of participation (Gutierrez and Rogoff 2003), 'affordances' for encouraging participation (Billet 2003) or 'conversational techniques' that foster participation (Gerhardi 2004) facilitate learning about practice. It suggests strongly that the aim of the pedagogy of participation has to be reformulated to move beyond Lave and Wenger's notion that the purpose of participation is to immerse us into the 'traditions' of practice. This is likely to simply result in us developing an attachment to a set of un-reflected social practices. The reformulated aim has to support us to explore possibilities for evolving practice (Griffiths and Guile 2004).

It can be argued that the social practice of reasoning with theoretical concepts offers a way for us to go beyond Lave and Wenger's argument that participation is an epistemological principle of learning because it encourages us to ask a series of further but interconnected questions. The first type of question, are those designed to 'affirm' whether our self-conceptions about practice are adequate in relation to their stated purpose; and to 'reassure' ourselves about the aspirations that we have for this form of practice and its contribution to our future (Pinkard 1996: 11). For us to feel affirmed and reassured we have to ask a number of interrelated questions: for example, why do communities of practice accept certain reasons as justifying what they do? Why do they respond to some sceptical doubts about aspects of their practice more seriously than others? Are they concerned to uncover the links between the reasons for the relationship between their practice and other social practices. Our answers to these questions lead us to recognise that, even though we may feel affirmed and reassured by the accounts we accept, the answers may, in some way, be 'self-undermining'; that is, there is some aspect of what they take to be authoritative that is contradictory. This leads us to ask the second type of question; namely whether our aspirations for

practice are being undermined in some way with the result that it is necessary to rethink the presuppositions for, and the social organisation of, practice[12].

The claim that the social practice of reasoning with concepts constitutes a way to critically examine the claim that participation is an epistemological principle of learning should not be interpreted as a restatement of Lave and Wenger's argument about the clash between 'old' and new' timers. That merely reflects different conceptions about how we can accomplish the existing tasks or situations; it does not encourage us to identify the idealised and conceptualised basis of practice nor to re-consider the goals of practice in light of this. In contrast, my argument implies that the social practice of giving and asking for reasons offers us a way to develop, to borrow Knorr Cetina's (2001) term, an 'epistementality' towards practice and participation in a number of senses.

The first sense is to commit ourselves to examining critically why a community of practice acted to form the goals that practice is designed to realise in the first place. The second sense is to consider whether those goals are self-undermining because they are failing to make good on the terms that were set for them and, therefore, the goals as much as the practice should be subject to review. The third sense is to consider whether the community of practice should strive for something beyond the existing form of practice.

These remarks about the centrality of the social practice of reasoning with theoretical concepts to the development of an epistementality towards practice and participation might be misinterpreted as meaning that it is possible to find answers to the dilemmas of practice in or through theory. This is not the case. The answers are found through developing an expanded conception of participation that presupposes, at least, the two new forms knowledgeability that were discussed in Chapters 8 and 9.

[12] Equally, for contingent reasons, this reappraisal may never occur. Contingent failure to address contradictions does not, however, mean that the reappraisal of presuppositions and practice was not required. It may mean that we strive to live with or accommodate the contradictions or that they continue to dog any attempts to revise and/or reconfigure practice.

The first form is to use theoretical concepts to identify the reasons for the organisation of practice and what follows from this particular organisation compared to an alternative form of organisation. The significance of this remark can be clarified by returning to the discussion of Zuboff in Chapter 4. Zuboff demonstrated that the deployment of new technology in banks and pulp mills resulted in two radically different conceptions of technology - 'automation' and 'information' - and two radically different conceptions of practice - 'action centred' or 'intellective'. We could never grasp the reasons that lay behind and shaped these distinctively different managerial conceptions about the deployment of technology and their implications for knowledge and skill from Lave and Wenger's notion that pedagogy is an implicit feature of participation. To comprehend these different forms of practice, we have to use theoretical concepts that lie beyond the immediate context of the banks and wood refineries to reveal the way in which different managerial ideologies resulted in radically different conceptions of technology and practice. This presupposes forming a reflective goal for participation that does not leave us trapped inside the existing conventions of practice, enables us to identify the idealised and conceptualised basis of practice, and to envision from that knowledge basis new possibilities for practice.

The second form of knowledgeability is to use the social practice of reasoning with concepts to bridge what the thesis referred to in Chapter 4 as the different epistemological traditions which inform different conceptions of practice. The significance of this remark can be illustrated by reminding ourselves of the main features of inter-professional activity in the knowledge economy; namely that it entails mediating the different forms and combinations of theoretical and everyday concepts held by professionals.

The social practice of reasoning with concepts serves a number of purposes. It enables us to identify what Hall and colleagues (2002:207) refer to as the 'selective visibility' and 'distribution of cognition' that foster inter-professional

collaboration. The former term alerts us to the way in which we develop hybrid and selective forms of perception and action by taking account of different work practices and local accountabilities. Although this outcome of this activity is provisional, it enable us to locate that outcome of that mediation in the space of reasons, and to reveal the system of mediating connections which inform the judgements and assessments about practice. The latter term reflects our use of dialogue and mediating artefacts to make our ideas and suggested actions accountable to one another. In doing so, we are able to grasp the different way in which we contribute to the idealisation of the natural and social world through our practice, and to begin to identify how we might change practice. It is the development of these forms of knowledgeability through our participation in practice that enables us to address the challenges associated with the knowledge economy.

The conception of a pedagogy of participation advanced in this chapter, therefore, requires us to conceive of theoretical concepts as tools that we reason with to reframe practice by analysing it in a different light, and to evolve practice in ways that are consistent with its revised purpose. Stated in slightly different terms, although knowledge, skill and identity are 'posited' by the practices of a community, we have to use cultural tools which are external to the community of practice to go beyond the current conceptions of knowledge, skill and identity conferred by such communities (Packer and Goicoechea 2000: 234). What is excluded from this notion of the pedagogy of participation is any sense that we may want to expand the purpose of, and to transform the organisation of, practice. This issue forms the link to the third strand of the pedagogy of mediated activity and involves a reapprisal of Engeström's theory of expansive learning.

The pedagogy of expansion

The cornerstone of Engeström's theory of expansive learning involves two inter-connected claims: (i) that contradictions are the principle of self-movement in activity systems; and (ii) that the cycle of expansive learning (CEL) can be used to re-think the purpose of activity and overcome the double binds that

inhibit changes in activity systems, and this enables us to transform activity systems[13]. The argument about the connection between the three strands of the pedagogy of mediated activity calls for a re-thinking of the theoretical and pedagogic conclusions Engeström drew about the link between contradictions and change in activity systems.

The primary reason for this re-thinking lies in the difference between our respective ideas about the way in which educational institutions should respond to the challenge posed by the knowledge economy/society. Like the management theorists discussed in Chapter 2, Engeström argues that the constant pressure to innovate in the knowledge economy is resulting in the emergence of new modes of knowledge and activity. The basis of this new knowledge, according to Engeström, is theoretically-grasped practice; that is, a new type of concept formed from conceptualising everyday knowledge. This appears to deny that educational institutions have any role other than in the form of the research interventions that were described in Chapter Seven.

In contrast, the thesis has drawn a rather different conclusion about the knowledge economy. First, it has maintained, following Knorr Cetina, that the knowledge economy is characterised by the spread of knowledge cultures which are 'lining' the world with different types of knowledge processes and forcing us to reappraise the relation between different types of knowledge and activity. From this perspective, there is a two-fold educational challenge: first, to redesign curricula to support members of activity systems to bridge different epistemological traditions; and, second to support activity systems to produce new knowledge and activity. The thesis has maintained that both challenges presuppose the mediation of theoretical and everyday concepts. Second, it has elucidated the philosophical implications of our activity in the world by drawing on the ideas of Ilyenkov and McDowell. This led us to maintain that our activity

[13] It may be helpful to remember that when Leontiev formulated the theory of activity, the term activity had two meanings: one meaning refers to human activity in general while the other refers to specific activities (i.e. education, work) that constitute the first level of his three-fold typology of activity. Engeström's concept of an activity system maintains and elaborates these distinctions: the concept can be applied to refer to either a social institution such as education or to specific educational

inscribes meaning in the world and, in the process, creates a normative context - the space of reasons that allows us to make judgements about thought and action.

Taken together, Knorr Cetina, Ilyenkov and McDowell enable us to identify a number of issues about activity systems that have yet to surface in Engeström's work. The first issue is that the spread of knowledge cultures and the pervasive presence of expert systems and knowledge processes in advanced industrial societies suggest that it is necessary for all activity systems to develop what Knorr Cetina referred to as an 'epistementality' towards knowledge and activity. This refers to a capacity for activity systems to consistently generate from within themselves a basic scepticism about the purpose of activity and/or the social practices that realise that purpose, rather than to rely on external forms of intervention and support. This implies that Engeström's research methodology (which can only support a limited number of activity systems), is not, as it stands, geared up to address the wider challenges which activity systems confront. This point will be returned to later.

The second issue is that the inscription of meaning in activity systems predisposes members of those systems to take certain types of reasons as authoritative for themselves and for their practice. Hence, it is the shared social norms that structure and inform the space of reasons which allow us to articulate the reasons for our assertions about the purpose and the organisation of practice, and for others to accept or challenge those reasons when attempting to change practice. The idea of authoritative reason is a much more subtle and powerful way to conceptualise the scope for, and the constraints on, human thought and action than Engeström's notion of the 'rules' of an activity system. The latter is an instrumental definition of norms as sanctions that specify and regulate procedures and interactions amongst individuals and groups. The former is an acknowledgement that we can only engage in self-questioning, as Pinkard (1996: 6) observes, because of the 'kind of hold that certain norms have

institutions such as schools, universities and so forth. Hence, the object of activity is determined by the sense in which the concept of activity system is actually being used.

on us'. That is, the way that norms predispose us to, for example, adopt certain roles in order to reason, recognise the right of others to advance certain kinds of arguments and to give accounts to others that affirm what we think constitutes good reasons for our actions and beliefs.

The above observations anticipate the third issue, that to understand, let alone change activity, it is necessary to identify the link between meaning and reason in activity systems. This suggests that the resolution of contradictions in activity systems not only involves the formation of new concepts, it also involves changes in what counts as authoritative reasons within that system and changes in the way that new norms associated with those concepts predispose us to reason. This is partially because change is never accomplished in activity systems merely through the formation and the implementation of a new concept. The literature on organisational change is littered with examples of changes that either failed or were never fully realised as a result of ignoring the 'meaning' of the change for individuals (Fullan 2001). Change occurs when, in addition to being actively involved in the formulation of a new concept, members of activity systems are also able to locate new concepts in the space of reasons and engage in the social practice of reasoning with that concept. For this to happen, it is necessary to develop the forms of knowledgeability that allow us establish the validity and the explanatory power of a new concept and to use that concept to question and to change practice[14].

Addressing the link between contradictions and reasons involves us distinguishing between and confronting, at least, two types of 'doubts' (Pinkard 1966: 7). The first doubt is whether the reasons we take as authoritative as regards the purpose and social and cultural constitution of activity should continue to remain authoritative in light of the identification of contradictions in an activity system. In confronting this type of doubt, we are forced to decide whether we want to call or not call into question those reasons and, as a corollary, to re-think the purpose of activity. The second type of doubt is the

question of whether the account that is given by members of activity systems as regards their social practices are in order and, consequently, do not warrant any kind of change to those practices. In confronting this type of doubt, we chose whether to affirm the validity of the existing purpose of activity and to reconfigure the social practices which are intended to realise it.

The theory of expansive learning was primarily formulated to address the former type, although it is certainly possible to use it to address the second type. Contradictions are best addressed, according to Engeström, in a special space (i.e. boundary crossing laboratory)[15] where we can trace the past and present history of an activity system and formulate a new concept to envision its future possibilities. To recap Engeström's argument briefly. The new type of theoretical concept emerges as we use the CEL to produce a simple explanatory relationship, and use that kernel concept to grasp the object of activity by tracing and reproducing the logic of its development and historical formation. The concept is progressively developed by mediating the 'declared' version of the concept (i.e. as formulated in a boundary-crossing laboratory) with our 'experienced' version of the same concept (i.e. the way it plays out in practice).

The resulting kernel is, as the discussion of Engeström's work in Chapter 7 indicated, equivalent to the primary abstraction which Vygotsky and Davydov maintained characterised theoretical concepts in disciplines because it has been produced in a similar way. Moreover, he maintains his concept has a number of advantages over the latter type of theoretical concepts. First, the generalisations which are contained in theoretically-grasped practice are 'expansive': they enable members of activity systems to embrace a radically wider horizon of possibilities than exist in the current mode of their activity. Second, they are 'embodied': they express the form in which we become conscious about, and can reflect on, the object of activity. Third, the generalisations are 'horizontal':

[14] I have continued the policy established in earlier chapters of substituting the term 'practice' for the second meaning of the term 'activity' (i.e. the purpose of an activity) to vary the mode of expression.

[15] Boundary crossing laboratories are established as a result of organisations agreeing to participate in his 'Development Work Research Programme' (see Chapter Seven).

they are produced iteratively through the interplay between declared and experienced concepts. Fourth, they are 'perspectival': they can be progressively reformulated as we move along a trajectory from 'where to' (i.e. the horizon of future possibilities) to 'what' (i.e. an agreed outcome). Finally, it is a free-standing concept characterised by, to borrow McDowell's term, its own space of reasons.

This approach to concept formation is less radical and less helpful in relation to the challenge of resolving contradictions, let alone the challenges it has been maintained that the knowledge economy poses, than it initially appears. Developing a capacity for self-questioning presupposes that activity systems can bridge the different epistemological traditions, knowledge processes and conceptions of reasoning that exists within them. This suggests that any space created to address contradictions in activity systems, for example, a boundary crossing laboratory, has to serve an additional epistemological and pedagogic purpose to those identified by Engeström. The purpose is in supporting us to formulate the new authoritative reasons that underpin and inform the use of the new concept and to reason with the concept.

This broader-based epistemological space and pedagogic approach is required for a number of reasons. The first reason is that Engeström argues that the CEL is a sufficient cultural tool to analyse and resolve contradictions in activity systems. Thus, he assumes that we do not require access to theoretical concepts that lie beyond our immediate circumstances to analyse activity systems. Activity systems are, however, very complex; while the CEL may facilitate access to the collective memory of members of the system, theoretical concepts help us, as Lahn's (forthcoming) reinterpretation of the development of the 'care agreement' demonstrated, to reveal the idealisation of activity systems. In the case of the Finnish Health system, this might refer to the way in which 'new managerial' concepts and practices inscribed the values of continuous improvement into the health system and were a contributory influence on the formation of the concept of the care agreement.

The second reason is that the critique Engeström levels against Vygotsky that he conceived of concept formation as a 'vertical process' and an 'intellectualist' activity, is a misinterpretation of Vygotsky's position about concept formation. First, Vygotsky's remarks about the longitude and latitude of concepts clearly indicate that he appreciated that concept formation (i.e. learning existing theoretical concepts) had a vertical and horizontal dimension. The longitude of concept formation is used by Vygotsky to highlight the way we establish the meaning of a theoretical concept in relation to the field in which it originated. The latitude is used to highlight the way in which we use a theoretical concept to guide our thoughts and actions in the world, for example, to locate the concept of mediation in relation to such concepts as 'dialectic', 'mind', activity' and so forth and to simultaneously use it to re-think the way we understand our everyday conceptions of our experience of the world.

It can be argued that the reason Engeström glosses over Vygotsky's ideas about the vertical and horizontal dimensions of concept formation is because he treats the 'creative middle' (Engeström *et al.* forthcoming) - the meeting of theoretical and everyday concepts, as though it is a black box where, ultimately, the former nullifies the latter. This is in many ways understandable since Vygotsky's very powerful metaphor that theoretical concepts 'grow down into' everyday concepts tends to confirm such an interpretation. Moreover, many of Vygotsky's own descriptions of concept formation also stress the 'vertical movement' of thought because he was describing aspects of the transition from everyday to theoretical concepts (Vygotsky 1987: 226).

Vygotsky is, however, making a much more nuanced argument than Engeström gives him credit for. Vygotsky's (1987: 229) self-critical observation that in his earlier work he ignored the fact that 'each new stage in the development of generalisation depends on the generalisation found in the preceding stages' allowed him to significantly broaden his understanding of concept formation in two senses. The first sense is that he appreciated that our understanding of, to invoke Brandom's term, the propositional content contained within a generalisation enables us to infer what follows from

grasping a specific generalisation. The second sense is that there are two lines of inference. The vertical line enables us to make links with other theoretical concepts and, in the process, to move beyond the immediate context by having the connections between aspects of the world disclosed to us that would otherwise remain hidden. For example, Vygotsky's concept of mediation offers us a way to overcome the two worlds of knowledge in philosophy, psychology and sociology. The horizontal line enable us to use theoretical concepts to mediate our everyday concepts, and in the process, to question the givenness of our experience of the world. For example, Vygotsky's concept of mediation enables us to comprehend that conceptions of experience which are rooted in our observable features and felt emotions fail to detect the conceptualised and mediated character of experience.

It is my contention that the horizontal and vertical dimensions of concept formation are central to overcoming the two worlds of knowledge and that there are a number of theoretical consequences for Engeström from only concentrating on the horizontal dimension of concept formation. It leads him, as was noted in Chapter &, to rest his definition of the new type of theoretical concept he has formulated only on its methodological basis. Thus he severs the idea of generalisation from the wider system of knowledge Vygotsky argued provided the system of judgements in which theoretical concepts are disclosed. The crucial feature of theoretical concepts is that they are produced through the interplay of substantive and methodological concerns. Theoretical concepts are:

'the result of a discovery of more or less significance which reforms the ordinary conception of the whole area of phenomena to which it refers, and even transcends the boundaries of the given group of phenomena within which it was first observed and formulated'.

Vygotsky (1997: 240)

Thus, it is their substantive basis as much as their methodological basis that enables new knowledge to be continually developed in different fields[16]. By

[16] This is possible because, as Vygotsky (1997: 241-2) observes, the distinguishing feature of the development of a theoretical concept is it can move from being perceived as an influential idea, to dominating a field, to, ultimately, arriving at a point where it can no longer be developed without

ignoring the substantive basis of theoretical concepts, Engeström overly limits the explanatory power of the new type of concept he has formulated because the defining feature of theoretically-grasped practice is the frame of reference which is constructed during the application of the CEL.

The implications of abandoning the substantive basis of concepts can be illustrated by drawing on deVries's (1996: 302-3)[17] discussion of the differences between 'predicate', and 'descriptive reference' concepts. Predicate concepts are characterised by a wide range of conceptual connections to other concepts, for example, the concept of mediation offers an extensive number of illuminating explanatory inferences within Psychology or other disciplinary fields as well as horizontal inferences in relation to our activity in the world. In contrast, descriptive reference concepts are characterised by a limited conceptual scheme in two senses: their horizontal inferences are restricted by the concepts frame of reference; and because they lack a substantive basis it is difficult to make any vertical inferences. These observations suggest that instead of stressing and celebrating the radical differences between theoretical concepts and theoretically-grasped practice, it is necessary to recognise the difference the interdependence between these different types of concepts[18].

The link between concepts, reasoning and the transformation of practice helps to tie together a number of lines of the preceding argument which are central to the reformulation of the pedagogy of expansion. The first is that although we increasingly need to produce new concepts to respond to the challenge posed by the knowledge economy, the new type of concept that Engeström has

contradicting itself. He cites the history of development of the following concepts in Psychology - 'psychoanalysis, reflexology, Gestalt psychology and personalism' - to illustrate this claim.

17 The distinction between 'predicate' and 'descriptive reference' concepts was originally used by Hegel in a discussion of the link between reference and knowledge, rather than to illuminate the differences between theoretical and everyday concepts which are concerns of this thesis. Nevertheless, his distinctions are consistent with my argument that a concept's defining characteristic is its inferential capacity. For this reason, I have used them to differentiate between the range of explanatory inferences associated with theoretical and everyday concepts.

18 Fuller and Collier (2004) make a similar epistemological argument about how to overcome the differences between theoretical concepts. They maintain this goal can be achieved by renegotiating the boundaries between disciplines and between theoretical concepts and other types of concepts, to achieve greater democracy in the process of knowledge production and application.

devised to help us transform activity, by itself, leaves us in cul-de-sac. This happens because Engeström does not explicitly acknowledge the inferential purpose of theoretical concepts; namely that the content of each concept is articulated in terms of its inferential relations to other concepts and, that to be able to reason with one concept, we have to understand many other concepts. This suggests that the theoretical and practical value of a new concept, such as theoretically-grasped practice is established because it is part of a package of concepts, for example, an activity system, mediation. Moreover, it is this package that enable us to grasp the relations between different modes of activity as well as the reasons that inform their organisation.

The second line of argument is that given Engeström's firm emphasis on the contribution that concepts make to the transformation of an activity system, it is vital to recognise that any talk about concepts is, to paraphrase Brandom (2000: 11), talk about their roles in reasoning. This presupposes reconsidering the relation between activity and reasons in the pedagogy of expansion by recognising that it is our participation in the social practice of giving and asking for reasons that enables us to 'confer conceptual content on performances, expressions, and states suitably caught up in those practices' (Brandom 2000:11).

At first sight, this claim seems to be consistent with Engeström's position since he, as Chapter 7 noted, claims the epistemic potential of new concepts such as the 'care agreement'. The process of conferring conceptual content on performances, expressions, and states caught up in social practice is nevertheless a much more multifaceted process than Engeström acknowledges. One reason is that our existing concepts are never wholly nullified when we learn a new concept, hence the legacy of our previous understanding influences the extent to which we use the new concept to guide our thoughts and actions. Another reason is that learning to reason with a new concept presupposes that we can infer what follows from the concept by making 'explicit what is implicit' in the concept (Brandom 2000: 32). This means that when we accept the propositional content of theoretically-grasped practice, for example, that the 'care agreement' offers us a way to provide a holistic pattern of health care

compared to existing practice, we still have to identify what remains implicit in using that concept. This requires us to draw on theoretical concepts external to the immediate context to help us to articulate what remains implicit.

The third line of argument is that for us to use a new concept such as theoretically-grasped practice to overcome the two worlds of knowledge two conditions have to pertain. The first condition is that we accept that the purpose of the concept is to put us in contact with the world and this entails explicitly acknowledging the inferential role of concepts. The second condition is that we recognise that to establish a concepts inferential role, we have to be able to mediate it horizontally and vertically. The former line of mediation enables us to make links with other theoretical concepts and thus to move beyond the immediate context, while the latter line of mediation enables us to mediate critically our participation of the new form of activity.

Conclusion: towards a pedagogy of mediated activity

The rationale for the pedagogy of mediated activity (PoMA)

What is distinctive about the argument presented in the thesis is that it is an attempt to articulate a social theory of pedagogy to respond to the debate about the new role of knowledge in the knowledge economy/society thesis. This calls for an engagement with issues that spill over into philosophy, psychology and sociology, even though pedagogy is not primarily a philosophical or sociological endeavour. The argument presented in this thesis has a very different purpose compared to the earlier discussion of the 'pedagogies of reflection' and the recent debates between representatives of different theoretical camps in learning theory.

The latter, unlike the former, have acknowledged the existence of an epistemological divide between such theories as Activity Theory and Situated Learning (Lave 1993), Situated Learning and Constructivism (Cobb 1994) and Situated Theories and Cognitivism (Grenno 1997; Anderson *et al.* 1966).

Moreover, the proposed solutions to these debates have been framed in terms of the need to reconcile epistemological and ontological differences (Packer and Giocoechea 2000) to synthesise Activity, Constructivist and Cognitivist perspectives (Hatano 1993). Whilst not wanting to appear dismissive of those concerns nor the proposed solutions, my argument about PoMA is not pressing the case for a reconciliation or synthesis between different pedagogic approaches to overcome the two worlds of knowledge.

In contrast, the main idea that has animated this thesis is that Vygotsky's concept of mediation, which has been elaborated and extended by drawing on a diverse number of writers, provides a way to overcome the gap between the two worlds of knowledge. The basis of this reconceptualisation of mediation is the claim that ideal (that is, non-material) phenomena, for example, values and reasons, exist in the material world. Once we accept this proposition it become apparent that the world can offer us reasons for how and why things are because there is a normative context – the space of reasons, within which we assess the respective explanatory merits of theoretical and everyday concepts.

Thus, in drawing on philosophers such as Brandom, Ilyenkov and McDowell, the thesis is calling for a radical reconceptualisation of the relation between mind and world and, by extension, theory and practice/activity and reasoning and pedagogy. Furthermore, it is also maintaining that this reconceptualisation is required to respond to the growing interdependence of theoretical and everyday concepts that the thesis has argued that the knowledge economy has generated. In light of these challenges, it is no longer tenable to accept that the central issue in pedagogy can be captured by the metaphors 'reflection', 'acquisition' or 'participation'. Each of these metaphors maintains, albeit in different ways, the two worlds of knowledge. The challenge is to identify the pedagogic practices that facilitate the capability to:

- perceive the relation between theoretical and everyday concepts;
- infer what follows from placing actions, events and concerns within a space of reasons;

- create new knowledge and to negotiate a new space of reasons within which to locate that knowledge.

Addressing these challenges presupposes that we can see the interdependence between the three purposes of learning - reposition, participate, expand, that the thesis has identified. This is because, depending on our starting point, they make different contributions in assisting us to address those challenges.

The principles and practices of PoMA

The above claim can be illuminated by reminding ourselves of a number of central ideas that have informed the discussion in this chapter. The first idea is that when we critically interrogate existing concepts or practice or even when we formulate new types of concepts to help us to transform activity systems, we have to be able to identify what follows vertically and horizontally when we mediate theoretical and everyday concepts. This means that rather than following the tendency in Activity Theory to see the lineage from Vygotsky through Lave and Wenger to Engeström as one conception of learning supplanting another or as a battle between conflicting metaphors for learning - acquisition, participation and reflection, a different response is required. It is important to appreciate not only the different outcomes of learning that the pedagogies of repositioning, participation and expansion make possible, but also the interdependence that can exist between these modes and outcomes of learning.

The second idea is that in order to grasp the difference and interdependency between the pedagogies of repositioning, participation and expansion we have to engage in the social practice of giving and asking for reasons. This social practice presupposes that we accept the value of the distinction between theoretical and everyday concepts and view them as serving a functional role in facilitating reasoning in different contexts. By adopting this position we are further presupposing that theoretical concepts disclose aspects of the world that would otherwise remain hidden or obscured from view, thus enabling us to

offer intelligible, reasonable and rational judgements about the natural and social world.

The third idea is that the knowledge economy presupposes the creation of knowledge cultures and an ability to continually mediate the relation between theoretical and everyday concepts to rethink the purpose of social practice and to evolve and transform it accordingly. This stands in stark contrast to the current emphasis in UK educational policies of treating the knowledge economy as a given reality which we are expected to adapt through a commitment to 'lifelong learning'. This stance equates knowledge with qualifications and conceives of the challenge of the knowledge economy as the extension of access either to existing qualifications or to new ways of acquiring those qualifications. As a consequence, UK educational policies remain silent about the link between epistemological and pedagogic issues that lie at the heart of knowledge economies/societies.

A number of things follow from the above discussion. First, we can use a number of the new principles of mediation that have been identified - the idealisation of the world, the locatation of thought and action in the space of reasons, and the social practice of reasoning, to extend and elaborate our understanding of the concept of mediation. Second, we can identify from the discussion of the connections that exist between the three theories of learning developed by Vygotsky, Lave and Wenger and Engeström a number of pedagogic principles for PoMA. This discussion has alerted us, amongst other matters, to the importance of the social practice of giving and asking for authoritative reasons, developing a reflected goal for participation, and the significance of the horizontal and vertical dimensions of mediation.

Based on the identification of the two sets of principles, this chapter maintains that it is possible to formulate a social theory of pedagogy – the *pedagogy of mediated activity*. It expresses this pedagogy of mediated activity in terms of a typology (see Table 10. 1). The purpose of the typology is to identify the difference and the interdependence between:

- the three theories of learning that the thesis has identified - learning concepts, learning to participate and learning to expand;
- the purposes of learning associated with each theory;
- the pedagogic principles that facilitate learning;
- the different outcomes of learning.

Typology of the *Pedagogy of Mediated Activity*

Principles of Mediation	**Pedagogy of Repositioning** **Pedagogic Principles**	**Pedagogy of Participation** **Pedagogic Principles**	**Pedagogy of Expansion** **Pedagogic Principles**
Identify the idealisation of the world	Think in theoretically-informed ways • use theoretical concepts to facilitate reasoning	Form a reflective goal for participation • use theoretical concepts to identify the reasons for the organisation of practice	Identify contradiction in activity system • use theoretical concepts to identify the reasons for the organisation of the activity system • formulate new concept to address contradictions
Locate thought and action in the Space of Reasons	Grasp generalisation in theoretical concept • identify horizontal and vertical inferences that follow from the concept • use horizontal and vertical inferences to make links to other theoretical and everyday concepts	Form generalisations about practice • use generalisations to make connections between reasons and practice	Establish the reasons that inform the use o the new concept • identify mediating links between theoretical concepts and new concepts • use the reasons to guide the transformation of activity
Engage in the Social practice of Giving and Asking for Reasons	Examine critically the implications of the horizontal and vertical inferences • identify aspects of links that are authoritative • identify aspects of links that are self-undermining • develop criteria to question and evolve theoretical concepts and their inferences • re-think thinking in theoretically-informed ways	Examine critically the authoritative reasons for practice • identify aspects of practice that are authoritative • identify aspects of practice that are self-undermining • develop criteria to question and evolve practice • rethink reflective goal	Examine critically the authoritative reasons for the activity system • identify aspects of activity that are authoritative • identify aspects of activity that are self-undermining • develop criteria to question and transform the activity system • rethink contradictions

Chapter 11

Conclusion

The knowledge economy, knowledge cultures and pedagogy

The starting point for the thesis was the view that has surfaced during the last decade amongst certain social scientists and policymakers that we live in a knowledge society and work in a knowledge economy because 'knowledge' is now the critical economic resource. National governments have seized on this consensus about knowledge to offer us the comforting illusion that the solution to economic prosperity can be accomplished through expanding access to and offering increased choice about which 'knowledge' we acquire. In doing so, policymakers have placed their faith that a credentialist agenda is the way to create the conditions for a knowledge economy/society. This rosy scenario of the assumed link between the flow of knowledge-based jobs and the demand in the economy for increased qualifications has been questioned by a number of writers (Brown and Lauder 2004; Wolf 2003). This is an important issue that deserves fuller consideration than can be devoted to it here.

This consensus about the knowledge economy and its implications for educational policy is misplaced for other reasons. First, at the heart of the social science debate about the knowledge economy are radically different views about which form of knowledge constitutes the magic bullet for the economy: science or modes of knowledge other than science. One of the core arguments presented here is that the proponents of these two arguments about which form of knowledge is most important in the knowledge economy have overlooked an essential part of their own argument. This is that a knowledge economy/society presupposes the existence of epistemic cultures, that is, cultures that foster the production of new forms of knowledge and that these cultures are resulting in a

paradoxical development. Professional work is increasingly becoming more specialised while the solutions to the social, cultural and political problems professionals are expected to address increasingly cut across domains of professional expertise. Hence the solutions require inter-and intra professional collaboration. Despite this paradox the UK Government, in the case of areas where it can intervene directly such as education and medicine and, is 'drawn irresistibly towards certainties' (Edwards *et al.* 2002: 3). It has set great store, for example, to 'fine-tune' educational policy to resonate with the knowledge economy without appreciating the epistemological and pedagogic issues that lie at the heart of such an economy.

This observations alerts us to the second way in which the current consensus is misplaced. The focus on knowledge cultures and epistemic activity introduces a radically different interpretation of the knowledge economy from those put forward by the social and management theorists, and a radically different educational agenda compared to current credentialist policies. In the case of the former, it implies that epistemic cultures constitute the conditions for the knowledge economy and knowledge work. In the case of the latter, it implies that educational policies should support us to bridge the different epistemological traditions which we will encounter addressing social, cultural and political. Hence educational policy should be as much as concerned about pedagogy as it is about access to education.

The second core argument of the thesis is that one reason this pedagogic issue has never surfaced in educational policy is because of the legacy of the two worlds of knowledge in the debate about the knowledge economy. This legacy perpetuates the idea that there are two radically different types of knowledge which are different from one another which we somehow learn to relate to one another 'experientially' and 'tacitly' in the workplace. However, although it is important to acknowledge the differences between these two types of concept, it is also important to acknowledge the interdependent nature of their relationship

and the way in which the knowledge economy is making this interdependence more explicit than in the past.

It is the need to understand the difference as well as the relationship between different forms of knowledge that led us to introduce the third core argument. This is that Vygotsky's concept of cultural mediation and its extension and elaboration in new theories and pedagogies of learning by the post-Vygotskians provides the starting point to go beyond the two worlds of knowledge.

The thesis addressed the post-Vygotskians' reservations about this claim by discussing the work of Ilyenkov, McDowell and Brandom. It argued that the transformation of nature by human action results in an idealised world, that is, meaning and value are written into the natural and social world. One consequence of this idealisation is that the world offers us reasons for how and why things are; hence it provides a normative context - the space of reasons within which we assess the respective explanatory merits of theoretical and everyday concepts.

It elucidated the pedagogic implications of living in an idealised world and locating concepts in the space of reasons by argued that this involves a new form of knowledgeability - 'the giving and asking for reasons' based on the social practice of establishing inferences. The thesis maintained that this social practice enables us to see the interdependence between theoretical and everyday concepts and their respective contribution to our activity in the world. Hence it is only when we understand the connections between concepts and practice that we can appreciate there is not necessarily an unbridgeable gap between the two worlds of knowledge.

Based on the philosophical argument presented here, I have argued that it is possible to identify a number of criteria that underpin and inform the pedagogy of mediated activity (PoMA. Unlike many existing pedagogies that see concepts

as representations of the world, PoMA does not assume that we grasp theoretical concepts because we are taught them or we acquire them through our own self-directed efforts in their completed form. PoMA is predicated on the idea that knowing a theoretical concept is not a matter of mastering associative connections, rather it is an act of reasoning with a theoretical concept. The hallmark of this reasoning, irrespective as to whether it occurs in educational or workplace contexts, is that we can identify what follows vertically and horizontally when we use mediate existing theoretical or everyday concepts or when we formulate new types of concepts.

Understanding what follows from concept use is essential in contexts where knowledge is embedded for a number of reasons. First, the incorporation of different disciplinary traditions in the new modes of knowledge that are emerging and the involvement of stakeholders in the assessment of that knowledge presupposes that all parties can identify what follows vertically and horizontally from new concepts. Second, the embeddeness of theoretical concepts in the symbolic data we encounter in informated environments and in the judgements professionals make in inter-professional work also presupposes that all parties can identify what follows vertically and horizontally from new concepts. In both cases, it is only by knowing what follows that we are in a position to evolve or transform practice. Thus the challenge is to understand the basis of our mediated relationship with the natural and social and to use that understanding to formulate different options to further develop theory and-or practical activity.

Misconceptions about PoMA and their possible consequences

It is possible that in an era of 'evidenced-based' educational research and policy (Pring 2004) which has emerged as the UK governments' preferred way to guarantee 'certainty', PoMA will fail to impress educational researchers, fall on 'deaf ears' in the policymaking community, and be deemed to lack any tangible

benefits for practitioners. This range of responses might occur for a number of reasons.

One reason that PoMA may fail to impress some educational researchers is bound up with the shifts in Vygotsky's ideas about mediation during his relatively brief life. The early phase of his work was dominated by the sign mediation view of learning that is generally regarded as his legacy by a considerable part of the global research community (Prawat 1999a: 61). This is partly because Vygotsky's supporters in Russia deliberately withheld his growing interest in the semiotic basis of mediation from publication to protect him from hardcore Stalinists accusing him of corroding Marxist thought through the seeping influence of 'bourgeoisie ideology'.

One consequence of the global research community's acquaintance with the idea of sign mediation was the development of a number of pedagogic approaches, (one prominent example being 'reciprocal teaching' (Palsciner and Brown 1984) which focused on the formulation of strategies in assisting learners to assimilate the meaning of words). These approaches are not too dissimilar from cognitive psychologists' ideas about learning and, for that reason, have been subject to trenchant criticism within the Vygotskian community for failing to acknowledge the 'key role of socially developed cultural tools as mediators of intra- and intermental functioning' (Prawat 1999a 61). The mixed legacy, but widespread popularity, of pedagogic approaches such as 'reciprocal teaching' may lead large sections of the global research community, and many practitioners who are familiar with these schemes to feel that PoMA lacks pedagogic specificity.

Another reason is that after Vygotsky abandoned the sign mediation view of learning in favour of an approach that highlights the centrality of meaning, many post-Vygotskians and social constructivists interpreted his new position as a form of 'postmodernism before its time' (Prawat 1999a: 62). One of the best-known examples of this social constructivist interpretation of Vygotsky's work is

Wells (1999). Nevertheless, Wells (1999: 325) is highly critical of what he sees as Vygotsky's 'overly optimistic belief in the superiority of scientific rationalism and an unquestioning acceptance of the progressive and benign consequences of schooled instruction'. The solution to this dilemma, according to Wells, is to argue that the curriculum should reflect the 'needs and aspirations of learners' and that learners should be encouraged to construct their own knowledge.

One consequence of this position is that Wells and other social constructivist interpreters of Vygotsky's work, for example, Hatano (1993) and Lemke (1999) reject the emphasis in his writing on 'instruction', and the distinction Vygotsky made between theoretical and everyday concepts. They reject the former because they deem it to perpetuate a form of transmission where teachers' knowledge is held to be superior to that of the learner. Hence it is inconsistent with their goals to establish more democratic relationships between learners and teachers. Equally, they reject the latter because they maintain that it reflects an unproblematic attachment to an Enlightenment conception of knowledge, which perpetuates unequal relationships between learners and teachers. The concern of certain social constructivist interpreters of Vygotsky's work to combat what they take to be the legacy of abstract rationalism and his antipathy to cultural diversity, may predispose them to be hostile to the restoration of the mediation of theoretical and everyday concepts to the centre of learning. This may be interpreted as an unhelpful regression into an earlier phase of the debate about knowledge amongst post-Vygotskians.

One reason that PoMA may fall on deaf ears in the policymaking community is the sweeping influence of utilitarianism and postmodernism in educational policy and large swathes of pedagogic practice. The common link between, to reborrow Prawat's (1999) phrases from Chapter 5, the 'head fitting' tendency in utilitarianims and the 'head splitting' tendency in postmodernism is their respective attachment to the representational paradigm. The former sees learning as a process of fitting new information (i.e. representations) into an

existing framework. The latter sees learning as a matter of mastering the social practices of language to generate new representations of the world. Hence they are mired in the opposite side of the representational paradigm and concerned with either affirming the value of existing or self-constructed representations. One consequence is that despite their epistemological differences the pedagogic approaches associated with utilitarianism and postmodernism dovetail neatly into one another.

The head-fitting conception of the relation between mind and the world has influenced the generation of a number of highly popular approaches to facilitating learning, which is normally defined as increasing the performance of memory, such as Neuro Linguistic Programming, Learning Styles, Accelerated Learning and so on. The promissory potential of these different approaches to assist learners to absorb information has proved very attractive to policymakers and researchers (Hargreaves 2003). On the one hand, a causal link being attributed between these strategies and the current goals of educational policy to widen participation, support inclusion and foster self-directed learning. The basis of the causal link is that the aforementioned strategies are deemed be sensitive to learners' preferred ways of learning and, thus, more likely to assist them to realise their latent potential. In contrast, the head splitting conception with its attachment to the idea that the all reality is nothing more than a set of linguistic constructions has resulted in pedagogic stances that affirm the value of narratives to tell our story about our experience.

Both approaches end up sharing a commitment to a highly individualised conception of learning. We master content, according to the head fitters, if pedagogy is tailored to our cognitive preferences. While the head splitters maintain that we should be encouraged to use language to represent our experiences in a variety of different ways. Since representatives of these positions deny that we need to overcome the two worlds of knowledge, it is likely that they will be impressed by the claims made about PoMA.

The final reason why there may be reservations about PoMA, even in fields such as Professional and Vocational Education, Work-based/place Learning where professions are struggling to address one manifestation of the legacy of the two worlds of knowledge – the theory-practice divide, is as follows. PoMA has been formulated at a philosophical level and lacks any empirical evidence to substantiate the central claim about mediation. In light of the emphasis on evidence-based practice in the professions it would hardly be surprising if PoMA was received, at best, as a provocative but ultimately unproven attempt to overcome the gulf between theory and practice.

The epistemological and pedagogic challenges of PoMA

There are two challenges that will have to addressed 'head-on' in future to combat the misconceptions that may surface as regards PoMA and, thus, distort its reception within the educational research, policy and practitioner communities.

The first challenge is to further clarify the epistemological basis of PoMA. This is necessary because in making the argument that PoMA allows us to overcome the two worlds of knowledge by mediating between different types of concepts, I run the risk that the following may happen. On the one hand, writers in the educational research community who have been influenced by postmodernism may try to de-bunk my claim about PoMA. They may offer a caricature of the epistemological position that informs the thesis by claiming that it is merely an attempt to formulate a 'strong' social realist epistemological justification to shore-up an Enlightenment conception of knowledge. To accomplish this demolition of the core epistemological argument, they would have to eviscerate the concepts of ideality and space of reasons of their dialectical character and treat them as empirical concepts. This would re-establish the two worlds of knowledge and recast the space of reasons as an 'ideal' speech position between

mind and world. The net effect would be to claim that there never is little of intellectual merit in the core argument advanced by the thesis.

On the other hand, writers in the educational research community and policymakers might try to 'cherry-pick' aspects of PoMA to strengthen existing policy. One obvious example would be to appropriate the argument about the social practice of giving and asking for reasons in an attempt to enhance the status of key skills in the higher education curriculum. One of the possible attractions of this strategy might be to combat the widely held perception that key skills are reductionist and instrumentalist by providing an intellectual justification for their role in developing analytical skills.

What is distinctive about the thesis is that it identifies an epistemological problem in the argument about the educational response to the knowledge economy and then formulates a pedagogic solution to the original problem. The thesis has not engaged directly in the recent debates in Philosophy that are concerned with the relation between mind and world. Instead it has drawn on a number of recent developments in an attempt to enhance the case that Vygotsky's concept of mediation constitutes a way to go beyond the two worlds of knowledge. In addition, the thesis has relied on a strategy of demonstrating the deficiencies of the dominant utilitarianism and postmodern conceptions of pedagogy in the terms that they set for themselves and showing how a critique of these deficiencies leads to the type of pedagogy expressed within PoMA.

The second challenge is to validate the principles of mediation and pedagogy that underpin PoMA. The traditional response would be to argue for empirical research to be undertaken to convert the principles into a series of practical strategies, and to validate or reappraise PoMA in light of research evidence. There main difficulty here is likely to be that PoMA has been formulated to respond to the problem the thesis has identified with the educational response to the current conventional wisdom about knowledge economy. This is not a

problem that has been acknowledged in educational research, policy or practitioner communities. This is partly because the knowledge economy/society is now taken as the new 'given' reality we have to adjust to and current educational research projects are assumed to be responses to the challenge the knowledge economy/society. Hence, the attraction of funding and participating in a large research project to validate or reappraise PoMA may, in the current climate, be deemed to be poor value for money.

For these reasons, I would propose a very different approach: an approach, nevertheless, that is consistent with one of the central tenets of PoMA that contradictions are the source of movement and development within activity systems. This approach would entail entering into dialogue with either universities or professional associations/institutes that are currently expressing concern as regards the relationship between theory and practice, for example, accountancy or medicine. These professions are, for very different reasons, currently rethinking their approaches to professional formation. Many medical educators are beginning to voice frustration on their reliance on the Kolbian 'experiential learning' paradigm (Swanwick 2004). This approach is no longer seen as a way to facilitate the development of the forms of knowledgeability that enable doctors to infer what follows from patient diagnosis nor to foster the development of medical competence. In addition, many accountancy educators are voicing concerns about the traditional 'silo' design of university curricula in relation to the growing split between 'brass plate' accountants and accountancy as a preparation for the development of global business consultants (Hoskins and Anderton-Gough 2004). This suggests that these or other professions voicing similar concerns may be interested in participating in a research project that can be designed to address their needs in a new, albeit unproven, way. Such a project could address either doubts about the purpose of activity, for example, the efficacy of existing pedagogy and/or design of curricula or doubts about aspects of practice, for example, human resource development or management strategies.

They would, therefore, constitute an excellent testbed for PoMA because it would be possible to demonstrate the deficiencies of existing conceptions of the relationship between theory and practice in the terms that they have currently set for themselves. Furthermore, they would also show how their deficiencies lead to the type of pedagogic approach that characterises expressed within PoMA.

Final reflections

I appreciate that this is an ambitious thesis. It has identified the legacy of a longstanding epistemological problem - the two worlds of knowledge that has been the subject of an intense debate in the Philosophical and Social Sciences form any centuries, in the educational response to the knowledge economy. In doing so, it has introduced but not necessarily followed up the implications of the new argument it has made about the link between knowledge cultures and the knowledge economy/society. Moreover, it tried to address the problem of the two worlds of knowledge in pedagogic terms by drawing on theoretical positions that are, themselves, still in the process of being reconsidered and refined. For that reason, the thesis is likely to have skated over a number of complex conceptual issues. It may, therefore, be helpful to briefly clarify what I see as the sociological implications of my own argument before moving on to address the pedagogic issues.

The first issue is that we need to question the tendency amongst social scientists and policymakers to over assert that we are now living in a knowledge economy/society. This, in effect, reifies the concept of the knowledge economy/society into an absolute reality that can be quantified in some way. The switch in focus that I have proposed away from defining the knowledge economy/society in terms of the volume of knowledge-based goods and services towards a focus on the cultures that foster the production of knowledge, suggests that the concept of the knowledge economy/society needs tighter

boundaries. Instead of describing the economy *sui generis* as a knowledge economy, it may be more helpful to discriminate between organisations and networks within industrial sectors that have established cultures that foster knowledge production.

One possible way to introduce tighter boundaries to the concept of the knowledge economy/society might be to rethink Streek's (1994) notion of 'institutional preconditions'. This was originally introduced to articulate the political economic conditions for a 'high skills' society. The idea of epistemic preconditions suggests that social scientists should investigate empirically the extent to which the economy is actually characterised by knowledge cultures, and to identify the contribution that those cultures are making to economic and even social development. One advantage of this proposal is that it would also allow the part played by the different modes of knowledges discussed in the thesis as well as the different types of epistementality that foster knowledge production to be differentiated from one another more carefully.

One obvious issue about the epistemological and pedagogic issues addressed in the thesis is that the concepts of mediation and activity are more problematic than I may have acknowledged. This is partly because Vygotsky's argument that we live in a mediated world and hence his firm emphasis on culture and semiotic mediation is, as Derry (2003) has cogently demonstrated, heavily influenced by the 'legacy of Hegel and Spinoza' on his thinking. Yet, as Derry further observes Hegel's and Spinoza's philosophy is not 'easily accessible'. This means that it is imperative that great care is taken when discussing the way in which Vygotsky developed his ideas about mediation. I have endeavoured to do this by continually referencing the Vygotskian scholars who have examined the philosophical underpinnings of Vygotsky's thought. I accept, nevertheless, that I may be guilty of have presented an oversimplified version of his concept of mediation from time to time and, as a consequence, conveyed the impression

that mediation is either shrouded in mystery or an over-elaborate statement of the obvious.

It is also partly because after his death during the period of intellectual suppression in Russia, Vygotsky's followers, principally Leon'iev, tried to defend his paradigm by rebuilding his ideas about cultural mediation around the notion of 'object-orientated activity'. One outcome of this development was that instead of continuing the Vygotskian tradition of theorising human activity in its many different guises (education, play etc), many post-Vygotskians used activity as a 'key principle' for the explanation of something else, for example, changes in hospitals (Bakhurst forthcoming). I have tried to steer a path between remaining faithful to the original Vygotskian position while at the same time incorporating newer insights about 'object-orientated activity' and newer concepts 'activity system' into my formulation of PoMA. Once again, it is not inconceivably that the thesis has, from time to time, fallen between two stools with its usage of the term 'activity', and this may be confusing to the reader and even damaging, in ways that I have not recognised, to the core argument of the thesis.

Another issue is that the position aspired to in the thesis, which is fledged out through drawing on the ideas of Ilyenkov, McDowell and Brandom, seeks to use the concept of mediation, activity and reason in a very dialectical way. It uses that constellation of concepts to explain the nature of the social and natural world as an object of thought and to explain our relation to those worlds, the aspects of the natural or social world we chose to focus upon and the emergence of our different mental powers, for example, the development of our capability to reason with concepts, and, how our participation in certain specialised modes of activity (i.e. education, work) enables us to appropriate cultural tools (i.e. theoretical or everyday concepts) and to initiate ourselves into the space of reasons.

One problem with this position is that it can, as Bakhurst (forthcoming) has acknowledged, easily be read as a kind of 'transcendental deduction of the mind-world relation'. That is, a cultural historical story of how our minds and activity evolve. This is not my intention although I appreciate that the concepts of 'ideality' and 'unboundedness of the conceptual' may fuel such an interpretation because they imply the anthromorphising of the natural world. In contrast, I have argued that the above concepts allow us to appreciate why the natural and social world offer us reasons for our actions and what follows from understanding this.

Another obvious issue that the thesis skates over is that Vygotsky's original distinction between theoretical and everyday concepts is more problematic than I may have given the impression throughout the thesis. First, the term theoretical concept conveys the impression that the disciplines have common knowledge structures. This was not my intention and, for that reason, I have not felt it necessary to engage with the post-Bernsteinian (Beck and Young forthcoming, Daniels 2001) argument about the implications of 'vertical' and 'horizontal' knowledge structures in the thesis. My primary concern has been to probe the relation between two different forms of knowledge rather than explore variations in knowledge structures. I appreciate, nevertheless, that a fuller and more detailed exposition of my argument about the process of conceptual restructuring will require me, in future, to address the issue of knowledge structures' more directly.

Second, I have used Vygotsky's ideas about the interdependence between theoretical and everyday concepts, which was formulated nearly one hundred years ago, as a conceptual foundation to overcome the two worlds of knowledge. Thus, it could be argued that the distinction is insufficiently nuanced to reflect many of the developments about knowledge cultures and new modes of the production of knowledge reported within the thesis. Whilst I accept that further thought will have to be given to reformulating these two concepts to

offer a more differentiated conception of knowledge, my concern is to combat the presentation of that the knowledge economy/society as the new 'given' we should adjust to. Hence I would maintain that the enduring value of Vygotsky's argument about theoretical concepts is that it reminds us that even in the knowledge economy we still need to overcome to disclose what is hidden or obscured when policymakers invoke that term. I also acknowledge that, for the same reasons, I have not discussed the argument presented by some post-Vygotskians such as Valsiner (1998) that Vygotsky over-emphasised the role of theoretical concepts in everyday activity.

Finally, in an attempt to pose and answer the central question of the thesis I have critically interrogated a number of social and management theorists, Vygotsky and the post-Vygotskians and an eclectic range of philosophers and social scientists. In the process, I have provided the reader with both a way of rethinking those authors and a set of tools for rethinking the epistemological and pedagogic problems the thesis has identified. One of the inherent difficulties of an approach based on the use of second-hand tools is as follows. Their previous owners used them in ways that are subtly different from how I wish to use them and the legacy of those meanings is likely to permeate my reworking of them.

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